THE UTILIZATION OF LEVELED QUESTION AS INSTRUCTIONAL SCAFFOLDING ON ENGLISH LEARNERS' COGNITIVE ACADEMIC ORAL ENGLISH PROFICIENCY

A Dissertation

by

YUE MIN

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DOCTOR OF PHILOSOPHY

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ABSTRACT

With the influx of immigration in the United States, a large number of English learners (ELs) who speak a non-English language are facing challenge of developing academic skills in English. In the United States, among the increasing EL enrollments in public schools, young students, particularly those at lower grade in elementary schools are at a critical period for oral language acquisition that is associated with subsequent reading development and overall school achievement. Among domains of language proficiency, oral language proficiency has been found as a fundamental and significant factor on literacy development. The purpose of this dissertation is to examine effective instructional scaffolding that can promote EL students' academic oral language proficiency in English.

Based on the statement of introduction, definition, and significance concerning EL students' academic oral language proficiency, this dissertation provides a systematic review of effective instructional scaffoldings that promote EL students' academic oral English proficiency. Seven effective teaching strategies were synthesized for establishing effective instructional scaffolding. This study also tests the effects of virtual professional development on teachers' application of leveled question instructional scaffolding (QS) utilizing data from a federally-funded randomized controlled trial, as well as the effects of QS on first grade Hispanic-English ELs' oral language development through multilevel models. Furthermore, this study conducts a narrative review furnishing practical guide of teachers' usage of QS in English-as-foreign-language (EFL) setting. The results of this dissertation are potentially contributing to EL students' cognitive academic English oral language advancement along with the improvement of EL teaching strategies.

DEDICATION

To my dearest mother, father, and husband, thank you for your companionship and support.

ACKNOWLEDGEMENTS

I would like to express my greatest appreciation to my supervisor Dr. Tong for the unwavering support, mentoring, time, and patience in the past five years. I would not have gotten through this doctorate without your supervision. Particular thanks to my committee members Dr. Lara-Alecio and Dr. Irby, your continuing stimulation that guides me to be a qualified researcher and educator in Bilingual Education. Enormous gratitude also goes to other committee members Dr. Luo and Dr. Joshi— thanks for your constructive feedback and support, I would not have been able to stand where I am now at the academic stage without you.

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CONTRIBUTORS AND FUNDING SOURCES

This empirical study included data derived from the federal funded validation study titled, English Language and Literacy Acquisition – Validation (ELLA-V) (PR/Award Number: U411B120047), which was sponsored by the investing in innovation (i3) funding from the U.S. Department of Education and supervised by a dissertation committee consisting of Professors Lara, Irby and Tong.

Project ELLA-V validates through a randomized controlled trail the English interventions delivered among Spanish speaking students across grades K-3. Data from Grade 1 intervention in the school year of 2015-2016 was analyzed in this study. All work for the dissertation was completed independently by the student.

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CHAPTER I

INTRODUCTION

The United States is becoming ethnically and linguistically diverse in recent years due to immigration flows (Spring, 2017). Coupled with such diversity is the change of national demographics. According to the US Census Bureau (2015), English Learner (EL) population is reported to reach over 60 million with a 41.6 % rate of speaking English lower than "Very Well" level. Their home langauges mainly involve Spanish and Creole, Indo-European Languages, Asian and Pacific Island Languages, in which more than 37 million people speak Spanish at home. As a state located in US-Mexico border with enormous size of Hispanic population, Texas is home to a rapidly growing body of EL students (Borges, Zamora, García, Orozco, Cherpitel, Zemore, & Breslau, 2015). National figures indicate that the percentage of public school students who participated in EL programs in 2015-16 was 15.5% in Texas (where the study of this dissertation took place), which is 6.2% higher than the national average (Texas Education Agency [TEA], 2016).

Nevertheless, regarding academic achievement, these EL students have consistently been reported to lag their English monolingual peers (Chapa, 2013; Day, 2017; Goldenberg & Wagner, 2015; Kazakoff, Macaruso, & Hook, 2018). As displayed by National Assessment Educational Progress (NAEP) reports, EL students are underperforming at the 4th grade reading compared to non-EL students, and the achievement gap persisted from 4th grade to 8th grade (NAEP, 2015a, 2015b). Numerous ELs are therefore facing the risk of dropping out from school as a consequence of poor academic English language skills which are fundamental to the school

success (DeCapua, 2016; Irby, Quiros, Lara-Alecio, Rodriguez, & Mathes, 2008; Menken, 2010).

In 2002, No Child Left Behind (NCLB) was passed and stressed narrow down the racial achievement gap in the United States (Guilfoyle, 2006). In 2015, Elementary and Secondary Education Act identified Every Student Succeeds Act and ignited a federal support for elementary public education to establish high academic achievement on every student (Gordon, 2016; Nelson, 2016). Besides, more and more researches are warranted to answer the question as to how to best assist academic achievement of ELs (Darling-Hammond, 2015; Good, Masewicz, & Vogel, 2010).

Cognitive academic oral English proficiency is a critical component of academic learning structures, it is conducive to augment phonological, morphological, and orthographic awareness (Zhao, Joshi, Dixon, & Chen, 2017). Although ELs' oral communication becomes the cornerstone in their English classroom performance (Gordillo-Santofimia, 2011), they lack basic skills and rudiments to communicate effectively (Rubio-Alcalá & Martínez-Lirola, 2008). To support students achieving higher critical thinking level, teachers can apply instructional scaffolding (Borich & Stollenwerk, 1988; Nussbaum & Novick, 1982; Richards & Rodgers, 2014; Whittington, 2003). Instructional scaffolding refers to a synthesis assimilating various teaching strategies, appropriate instructional scaffolding is crucial to promote EL students' academic learning attainment.

Hinge on realistic considerations, this dissertation aims to discover efficient instructional scaffolding through systematic review, evaluate its effects through empirical study and generalize by conducting case study. The results of the dissertation are likely to provide guidance

of practicing effective instructional scaffoldings that can benefit more EL students from multicultural contexts in their English language acquisition.

Statement of Purpose

It has been reported that the population of ELs is growing rapidly in the United States, but these students have been continuously underperforming on English literacy compared to native English speakers (Goldenberg & Wagner, 2015; National Center for Educational Statistics [NCES], 2017). Oral language proficiency has been found as a significant factor reflecting literacy development (Babayiğit, 2015; Tong, Lara-Alecio, Irby, & Mathes, 2011), particularly for young ELs at elementary school grades (Joshi, Binks, Hougen, Dahlgren, Ocker-Dean, & Smith, 2009). To address EL students' oral language and academic achievement, teachers are facing one daunting challenge: how best to teach course content (Brookfield, 2017). During the educating procedure that guidance students achieve higher cognitive development level beyond current stage of cognitive development (Vygotsky, 1964), instructional scaffolding adopted by teachers functionally provides individualized support based on students' experiences and knowledge (Ninio & Bruner, 1978).

Consequently, it is critical to facilitate EL's learning of English oral language at an early school stage through effective instructional scaffolding, but overview of the recent literature accessed from major search engines (e.g., Google Scholar, Academic Search Complete, ERIC), few empirical study ever linking instructional scaffolding, EL students' oral language with VPD intervention among teachers under empirical research design. This study aims to discover and test effective instructional scaffolding so as to help EL students from multicultural background characteristic improving their academic oral English proficiency.

Assumption of the Study

Current study aims to examine a creative, reciprocal and effective instructional scaffolding strategy that is helpful for improving ELs' academic English oral language proficiency. I assumed the teacher's leveled questions scaffolding (QS) effects students' academic English oral language performance significantly and positively. The virtual professional development (VPD) intervention on teachers can help them practice QS strategy as ESL instructional scaffolding more frequently and efficiently.

Structure of the Study

In this dissertation, I choose the option of the Journal Article including three professional journal articles. In the first chapter I provide the introduction of this dissertation study, including statement of purpose, definition, and significance. Chapters II, III, and IV are three individual journal-ready articles. Chapter V presents discussion, conclusion and planning of future study.

Chapter II- Journal Manuscript 1

The first article (Chapter II) aims to exposit effective instructional scaffolding based on a systematic literature review. The findings are expected to be synthesized to establish an effective instructional scaffolding to improve EL students' cognitive academic English oral language ability.

Chapter III- Journal Manuscript 2

The second article (Chapter III) provides empirical evidence based on the data derived from a randomized control trail (RCT) project. The results of Chapter III highlight the significant effects of teachers' leveled question scaffolding upon first grade ELs' English oral performance.

Teachers who use QS strategy more efficiently were able to promote EL students' critical leveled thinking skills from their individual beginning cognitive stage to higher cognitive stage and reinforce their oral language capacity. The results of the article also suggest that virtual professional development intervention is a necessary intervention on teachers' mastering of QS strategy.

Chapter IV- Journal Manuscript 3

As a pilot study, Chapter IV analyzed the practicability and imperative to generalize QS scaffolding as ESL strategy in EFL countries, along with how to implement professional development among ESL teachers in these settings.

Research Questions

The primary interest of the study is to investigate effective teaching strategy to improve EL students' oral language proficiency, and explore the solution through tree journal article chapters, two research perspectives were generated in Chapter II:

1. What are the empirical studies on the delivery of instructional scaffolding to reinforce K-12 EL students' cognitive academic oral English proficiency between year 1978-2017?
2. How to identify an effective instructional scaffolding adapting for further research?

Two research questions were scrutinized in Chapter III:

1. Do teachers' leveled questions scaffolding (QS) usage predict first grade EL students' cognitive academic oral English performance?
2. Does one-year virtual professional development (VPD) intervention increase treatment teachers' usage of QS strategy?

More practical questions were propositioned in Chapter IV to disseminate preceding accomplishment:

1. What are the interpretation and recommended leveled questions scaffolding (QS) strategy?
2. Why disseminating QS among EFL students is imperative?
3. How to apply QS among EFL students to improve their cognitive academic oral English proficiency?

Previous studies concerning teaching strategies are finite in narrative statements based on teachers' personal experiences, my study premier adopts the scientific research methods-systematic review and then test a two-level model through an empirical study with quantitative data derived from a federally-funded randomized control trial (RCT), so as to examine the effects of virtual professional development and teachers' usage of scaffolding leveled question (QS) on EL students' academic oral English development. This study also adds more information to the literature on how to enhance EL's oral English proficiency. Furthermore, through a practice guide, the study extends the findings related to teachers' use of QS from English-speaking to English-as-foreign-language (EFL) setting. Therefore, my study is significant to generalize effective instructional scaffolding strategies among K-12 ELs' oral language development.

Limitations

First, to achieve high inter-rater reliability, the SR method requires at least one independent coder involved in the included articles coding (Manyike & Lemmer, 2011). In my dissertation, data was extracted by only one primary coder but has been verified by a second

coder, about details of all portion of study including research design, sampling, participants, variables, analysis, and results, etc. Second, data in the empirical study (Chapter III) came from ELs in only one grade level.

Definition of Terms

English Learner (EL)

An individual who is acquiring the English language actively as his or her non-primary language (Bardack, 2010). They have a limited ability to read, speak, write, or understand English, and may participate Bilingual or English as second language (ESL) program (Texas Education Agency [TEA], 2017a).

English as a Second Language Learner (ESL)

An individual who learn English as a Second Language in English-speaking country, where English is the official language or predominant language (Nation & Newton,2008).

English as a Foreign Language (EFL)

An individual who learn English in home language country, where English is not spoken outside the classroom environment (Nation & Newton, 2008).

Bilingualism

A person who can speak two languages fluently including the usage of four language dimensions: listening, speaking, reading, and writing (Baker, 1993).

English Language and Literacy Acquisition-Validation (ELLA-V) Project

ELLA-V was funded in 2013 by the Office of Innovation and Improvement under the title of Investing in Innovation Funding (i3-U.S. Department of Education; U411B120047). Project ELLA-V encompasses teachers and EL students across Texas from 75 schools and 10 participating school districts. The purpose of ELLA-V is to investigate the impact of English-as-second language (ESL) instructional intervention accompanying virtual professional development on Spanish-speaking ELs' English language acquisition from grades K to Grade 3 (Lara-Alecio, Irby, & Tong, 2012).

Latino Bilingual Students

Latino EL Students are EL students immigrated from Latin America, such as Mexico and Puerto Rico since 1960s, they were taught in both English and Spanish (Garcia & Bartlett, 2007).

First Language (L1)

Also called as native, primary or home language, it is the first language learned by a child. Children acquire the L1 in a natural way easily and gradually (Krashen, 1982). For Latino bilingual students, their L1 is Spanish, the second language is English.

Second Language (L2)

The second language learned by a child, learn their L2 from contacting target language environment, such as classroom activities (Krashen & Terrell, 1983). For Latino bilingual students, their L2 is English, first language is Spanish.

Minority Language

The language is spoken by a minority of the population living in a household or territory.

Transitional Bilingual Program (TBE)

In public schools, students who identified as English learners (ELs) are eligible to participate in bilingual or English as a second language (ESL) programs. Transitional Bilingual Program (TBE), also known as the early-exit bilingual program was started since 1974 when the Bilingual Education Act Title VII promulgated that promoting students with limited English proficiency. The government stressed Limited English speakers should sustain some instructions in their first language and transit to English program as soon as possible (Garcia & Bartlett, 2007; Lyons, 1990; TEA, 1998). The TBE aims to facilitate the LEP students transit to all-English instruction.

English Oral Language Proficiency

As foundation of literacy development (Genesee, Lindholm-Leary, Saunders, & Christian, 2005), oral language proficiency has been a critical factor determines whether EL students are capable to integrate into society or academic behavior, this is even more necessary for younger EL students because their oral language directly connects to their literacy (Joshi et al., 2009). Preliterate students usually start literacy acquisition by building a strong foundation in oral proficiency. The absence of a high-quality ESL instruction may cause students lack development of cognitive academic oral language proficiency, so they utilize oral skills for reading comprehension ineffectively (Spies, Tong, Lara-Alecio, & Irby, 2015).

Zone of Proximal Development (ZPD*)*

Between learners' higher mental processes and their original intelligence capabilities, ZPD functions as the area of learning when the learner is assisted by teachers or peers, who can help learners master the expected skill (Berk & Winsler, 1995; Kozulin, 2003, Vygotsky, 1964).

Instructional Scaffolding

Scaffolding means provides individualized support based on the learner's ZPD associated with students' stages of cognitive development (Vygotsky, 1964*).* Instructional Scaffolding means the instructors use various teaching strategies or techniques to provide sufficient support for learners to get their learning goals based on their experiences and knowledge. Instructional scaffolding is the combination different types of teaching strategies, whether the instructional scaffolding is effective enough depends on if it works as part of the process that fading instructors' responsibility and aids students improve cognitive level progressively (Ninio & Bruner, 1978).

Basic Interpersonal Communications Skills (BICS)

Social Linguistic Interactions embedded in a situational context (Cummins, 1979).

Cognitive Academic Language Proficiency (CALP)

Academic language applied in cognitive areas, such as the language of math, music, science taught in school class content (Cummins, 1979).

Leveled Question Scaffolding Strategy (QS)

Leveled Question Scaffolding (QS) is an instructional scaffolding designed based on upper-level Bloom's Revised Taxonomy (Irby et al., 2008; Lara-Alecio & Parker, 1994). It combines various teaching strategies such as asking a leveled question, random selection or giving cognitive feedback, and it contributes instructors' responsibility through pair-share study or students' spontaneous feedback.

Randomized Controlled Trial (RCT)

In order to testify specific intervention that influences research results controlling all other factors that might affect that outcome, researchers randomly assign individuals/clusters to either a treatment group which receives intervention, or a control group as contrast. For a proper experiment to be interpretable, it requires samples to be randomly assigned to diverse groups or treatment when all extraneous variables are controlled for (Campbell & Stanley, 1963). As a scientific experiment purposes to reduce bias, true experimental/ RCT has been used in the educational field for evaluating a number of educational interventions targeting ELs (e.g., Lara-Alecio, Tong, Irby, & Mathes, 2009; Tong et al., 2017)

CHAPTER II

EFFECTIVE INSTRUCTIONAL SCAFFOLDING FOR DEVELOPING COGNITIVE ACADEMIC ORAL ENGLISH PROFICIENCY AMONG K-12 ENGLISH LEARNING STUDENTS: A SYSTEMATIC REVIEW

Overview

In order to explore effective instructional scaffolding, a systematic review was implemented to synthesize empirical studies on examining effective instructional scaffoldings designed for improving ELs' cognitive academic oral English proficiency from year 1978 to 2017. Through a comprehensive search of educational electronic database (i.e. ERIC, LLBA, Academic Search Ultimate), 11 studies were extracted from 467 potential articles identified as in-depth review sources. Effective teaching strategies or instructional scaffoldings across recent 40 years were synthesized into 7 major categories: i.e., Affective training, Audio& Video, Cooperative learning, Leveled question scaffolding, Mixed-coding, Teacher's question, and Vocabulary exercise. Results revealed that currently there is an insufficient number of scientific experimental studies investigating effective teaching strategies to develop K-12 ELs academic oral English language. Furthermore, there is a lack of opportunity for teachers to receive professional development and coaching to improve their teaching strategies efficiently.

Introduction

According to the US Census Bureau report of 2010, over the decade from 2000 to 2010, Hispanic population increased by 43% and accounted for the largest percent of non-native English speakers with more than 35 million people speak Spanish in households across the

country. In public schools, National Center for Education Statistics (NCES) reports in 2014-2015 school year indicated that there are 4.6 million ELs with a 9.4% increase since 2004-2005 (NCES, 2015a, 2015b). Among those students, 3.7 million (77.8%) spoke Spanish as their home language, followed by other languages such as Arabic, Chinese, and Vietnamese. In Texas, based on the latest public-school enrollment data provided by Texas Education Agency (TEA, 2017a), ELs account for 15.5% of the total school students. Students were identified as English language learner because they need assistance on English proficiency to study academic content and compete with peers on school achievement (NCES, 2017). These students underperformed on academic assessments compared to their English monolingual peers, especially in the subjects comprehend with academic language content (Biancarosa & Snow, 2006; McGuinn, 2016). For example, NAEP (2015a, 2015b) announced both 4th grade and 8th grade EL students scored lower than non-EL students on average available reading tests since 1998 and this situation sustained until 2015. While by the end of 2012, on average only 35% immigrant students were offered adequate English proficiency program by school districts (U.S. Department of Education, 2012).

Oral language is the fundamental skill to develop ELs' English language proficiency because it sets a limit on language literacy ability, students' legitimate pronunciation facilitates their understanding towards written words (Barr, Eslami, & Joshi, 2012; Lesaux & Kieffer 2010). Fluent oral language utilization represents superior spelling, phonic, phonemic perception, word decoding which function essentially in understanding written literature (Barr et al., 2012; Goodwin & Ahn, 2010). ELs from diverse linguistic or cultural background speak a non-English native language at home, they may only have the chance to interact with classmates or teachers orally at school (Fillmore, 2000). However, principles of school teaching usually place less

emphasis on ELs' oral skill development compared to reading and writing skill (Rababah, 2016; Rader-Brown & Howley, 2014). As Texas education code §4.002 states, "The students in the public education system will demonstrate exemplary performance in the reading and writing of the English language". Although Texas Essential Knowledge and Skills (TEKS) standard suggests students should engaged in activities that strengthen listening and speaking skills. In Texas public school, Math, Reading, Science subjects are designed as first grade students' required courses without expansion on oral language improvement (TEA, 2017b).

Effective instructional scaffolding can better serve ELs to improve their oral language skills under restricted curriculum content design, which in turn can impact their subsequent academic achievement (Lam, 2010; Mandly, 2017; Proctor, Dalton, & Grisham, 2007). Instructional scaffolding means instructor provides support to students during teaching interaction. The assistant strategies include giving hint, group discussion, random selection and so on, which can help students participate actively and achieve higher critical thinking level beyond their current individual cognitive recognition (Bruner, 2006; Ninio & Bruner, 1978). The judgement criterions of whether an instructional scaffolding works effectively on EL students' oral language depends on whether it positively inspire students' oral involvement, such as pair share, choral response, and whether it positively enhance students' cognitive critical thinking (Van de Pol, Volman, & Beishuizen, 2010).

Theoretical Framework

In this systematic review, theory of instructional scaffolding was directed by Piaget's (1961) genetic epistemological cognitive development theory; Vygotsky's (1964) zone of proximal development (ZPD) theory and Bruner's (1978) instructional scaffolding theory. In the

1930s, developmental psychologist Piaget, the great pioneer of the constructivist theory of knowing, elucidated the stages of a child transforming, assimilating and accommodating new knowledge to construct and develop their natural intelligence. According to his theory, learning is a dynamic mental development stretching from existing knowledge to synthesizing potential knowledge (Piaget, 1964). He proposed that children's cognitive development experience four stages: Sensorimotor stage (under age 2)—children form perceptions towards the world through five senses; Preoperational stage— children use symbols at symbolic function substage (age 2 to 4) and become curious and ask questions at intuitive thought substage (age 4 to 7); Concrete operational stage (age 7-11): children become more aware of logic and conservation; Formal operational stage (age 11-16): children think abstractly utilizing metacognition (Piaget, 1965; Santrock, 2004). Although it seems that children reach higher level of cognition in relation to age, Piaget illuminates that children's intelligence was not a fixed trait that solely depends on ontogeny, instead, their cognitive development is due to biological maturation, interaction with the environment, and active experience (Piaget, 1961). Therefore, it's indispensable to rehearsal children's concrete-operational thinking at their intuitive sub-stage towards next cognitive development (Piaget & Inhelder, 1969; Szecsi & Giambo, 2004).

Between children's current actual cognitive level and further potential cognitive level there is a distance named Zone of Proximal Development (ZPD), adults with higher cognitive level are capable to provide support for children in ZPD (Vygotsky,1964). The ZPD theory emphasized function of school teaching, which developed Piaget (1961)'s theory from children being lone learner towards children being social interactive learner (Fernández, Wegerif, Mercer, & Rojas-Drummond, 2015). ZPD theory is meaningful to encourages adults guide children up to further critical thinking level by support. The process of the adults leads the children's learning

through focused questions, positive interactions, reciprocal teaching and dynamic assessment is called scaffolding (Awbi, Whalley, & Philpott, 2015). The support provided by an instructor that lead students towards successful academic achievement is nominated instructional scaffolding (Bruner,1978). Instructional scaffolding requires instructors tailor support such as key questions, outlines, to help student achieve their learning goals, effective scaffolding should guarantee learners' involvement and cognitive skill development. (Reynolds, 2017; Wood, Bruner, & Ross, 1976).

Purpose

In this study, a systematic review was carried out to report empirical studies focus on various sorts of instructional scaffolding on EL students' cognitive academic English oral proficiency. The research questions of this study are objected to:

1. What are the empirical studies on the delivery of instructional scaffolding to reinforce K-12 EL students' cognitive academic oral English proficiency between year 1978-2017?
2. How to identify an effective instructional scaffolding adapting for further research?

Method

Systematic review was chosen as the research method because it functions critically to synthesize and organize collected materials (Irby et al., 2008; Moher, Liberati, Tetzlaff, & Altman, 2010). In addition, based on the major searching engine records from ERIC, Google Scholar, and ProQuest in recent 10 years, there is no peer-reviewed academic journal article with a systematic review that focuses on EL's oral English proficiency.

Literature Selection Process

The database of this systematic review was built from three large online libraries of educational research and information: ERIC (Education Resources Information Center); LLBA (Linguistics and Language Behavior Abstracts), and Academic Search Ultimate.

Table 1

Included Thesaurus for the Systematic Review

Search ID	Search Terms	Search Options
S5	S3 AND S4	Limiters - Date Published: 19780101-20171231 Search modes - Boolean/Phrase
S4	(DE "Oral Language" OR DE "Language Acquisition") OR TI (language n1 (verbal or oral or acquisition or Proficiency or fluency)) or DE "Language Proficiency" OR DE "Language Fluency" OR AB (language n1 (verbal or oral or acquisition or Proficiency or fluency))	Search modes - Boolean/Phrase
S3	S1 AND S2	Search modes - Boolean/Phrase
S2	DE "English Language Learners" OR DE "English (Second Language)" or TI (esl or ell or (english n2 (language learner* or second language))) or AB (esl or ell or (english n2 (language learner* or second language)))	Search modes - Boolean/Phrase
S1	DE "Educational Strategies" OR TI (education* or instruct* or teach*) n1 (strateg*)) OR AB ((education* or instruct* or teach*) n1 (strateg*)) OR TI instructional scaffolding OR AB instructional scaffolding	Search modes - Boolean/Phrase

Table 1 identified searching terms used for conducting the systematic review, “English Language Learners”, “Instructional Scaffolding”, and “Oral Language proficiency” were used as key terms for searching title, abstract, and key words fields. “OR” function aids a more comprehensive searching range. Searching time ranges from Jan. 1978, the time point that instructional scaffolding notion put forward, to Dec.2017, the time point that started searching.

Diverse publications such as peer-reviewed journal articles, books, theses written in English language were all included as targeted resources. Various categories of research design such as systematic review, experimental study, observational study and descriptive studies were all retrieved as targeted resources.

Inclusion/Exclusion Criteria

After the initial search-based searching key terms, 483 results were found related to instructional scaffolding for ELs’ oral language proficiency, including 376 results from ERIC database, 32 results from Academic Search Ultimate database, and 75 results from LLBA, which. After the removal of deduplication, 467 items were retained. In furtherance of screening articles with two purposes of study, included criterions were identified as:

(a) English learner

(b) Instructional scaffolding

(c) Oral English proficiency

(d) K-12

Excluded criterions were defined as:

(a) Non EL

(b) Subject knowledge learning

(c) Not involving teacher

(d) Language assessment

(e) No adherence to scaffolding

(f) Not connected to teaching

(g) No adherence to oral language skill

(h) Non K-12

(i) Non public-school education

Abstracts Screening and Full-text Screening Outcomes

The online review tool Rayyan (Ouzzani, Hammady, Fedorowicz, & Elmagarmid, 2016) was used for independent screening of exported articles. Its tagging and filtering functions were successfully and efficiently applied in coding and organizing references.

During initial round of screening of title, keywords, and abstract, 79 articles were excluded because they are "not related to strategy" (e.g. investigation of pragmatics skills), 73 articles were excluded due to "not related to oral language skill" (e.g. foreign language writing instruction), 58 articles were excluded because their content is not associated to "K-12" (e.g. using music in the adult ESL classroom, it commonly occurred in the UK, or Asian countries such as China, Malaysia); 42 articles were excluded because "subject knowledge learning" (e.g. curriculum on mathematics); 15 articles about "not connected to teaching" (e.g. students' learning experiences abroad) were also deleted; 15 articles identified as "non-EL" (e.g. language attitudes towards French and Creole) were extracted; 6 articles were excluded because they are about "language assessment" (e.g. assessment for ESL students), 6 articles were deleted because they mainly discussed "non-public education" (e.g. after-school program).

Critical Assessment Outcome

After critical screening of 45 articles remained to be in-depth screening full-text, 34 non-empirical studies were excluded because authors do not include complete method, process, or results part. Lastly, 11 included articles with strong empirical evidence that met selection criteria were finally coded critically for further discussion (See Figure 1).

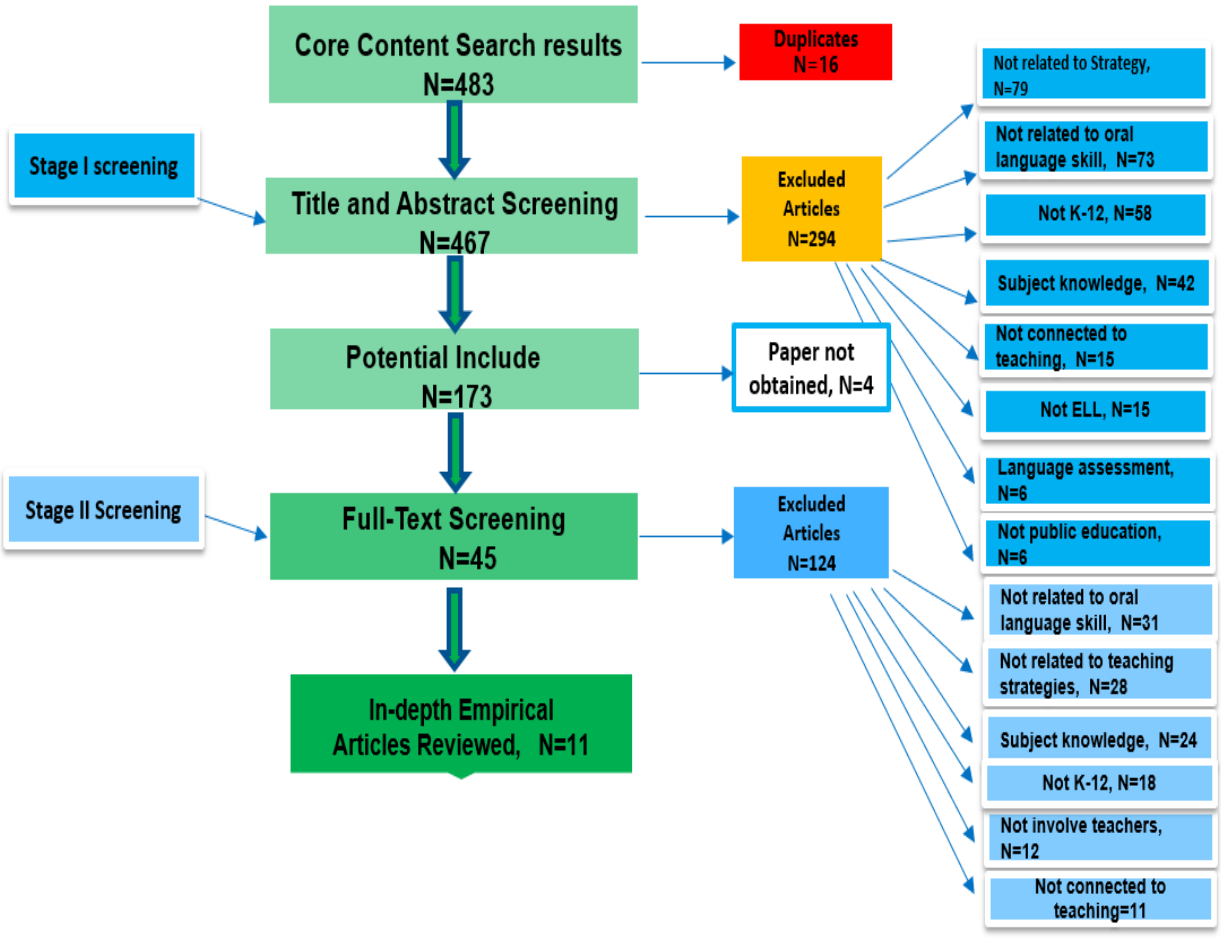

Figure 1. Systematic review screening phase.

After second round screening of 173 full-text content, 31 articles were excluded because they were “not related to oral language skill”; 28 articles were deleted because they were “not related to strategy”; 24 articles discussing subject knowledge were excluded; 18 “non K-12” articles were also be deleted (e.g. Extending Support for English Language Learners: A University Outreach Program); 12 articles were excluded because their content was “not involve teacher” (e.g. elementary principals should know and do), 11 articles were deleted because “not connected to teacher”. Finally, 45 articles remained as final database selected for in-depth review. The screening phase in Figure 1 was adhere to PRISMA (preferred reporting items for systematic reviews and meta-analyses) four-phase flow diagram checklist (Moher, Liberati, Tetzlaff, & Altman, 2010). PRISMA is a reporting guidance for conducting high-quality systematic review.

Results

Coding Protocol

A customized Excel spreadsheet was used as the systematic management tool for detailed screening and data extraction process based on PIECES (Foster & Jewell, 2017) and What Works Clearinghouse (WWC) review protocol (WWC, 2017). PIECES is an advanced coding approach designed for conducting and reporting a systematic review developed by Texas A&M University Liberians (Foster & Jewell, 2017), which lists items that should be exported from cited references into Excel format for critical screening in the field of medical research. WWC review procedure was developed by WWC for writing standard systematic review in educational studies. I combined both protocols according to structures of paper in Educational Psycholinguistic area and developed a systematic management tool as SICEP (Systematic review

Items for Coding Educational Psycholinguistics study), which is composed of 16 checklists and can be used for coding each included article in the excel workbook in educational psycholinguistic study (see Figure 2).

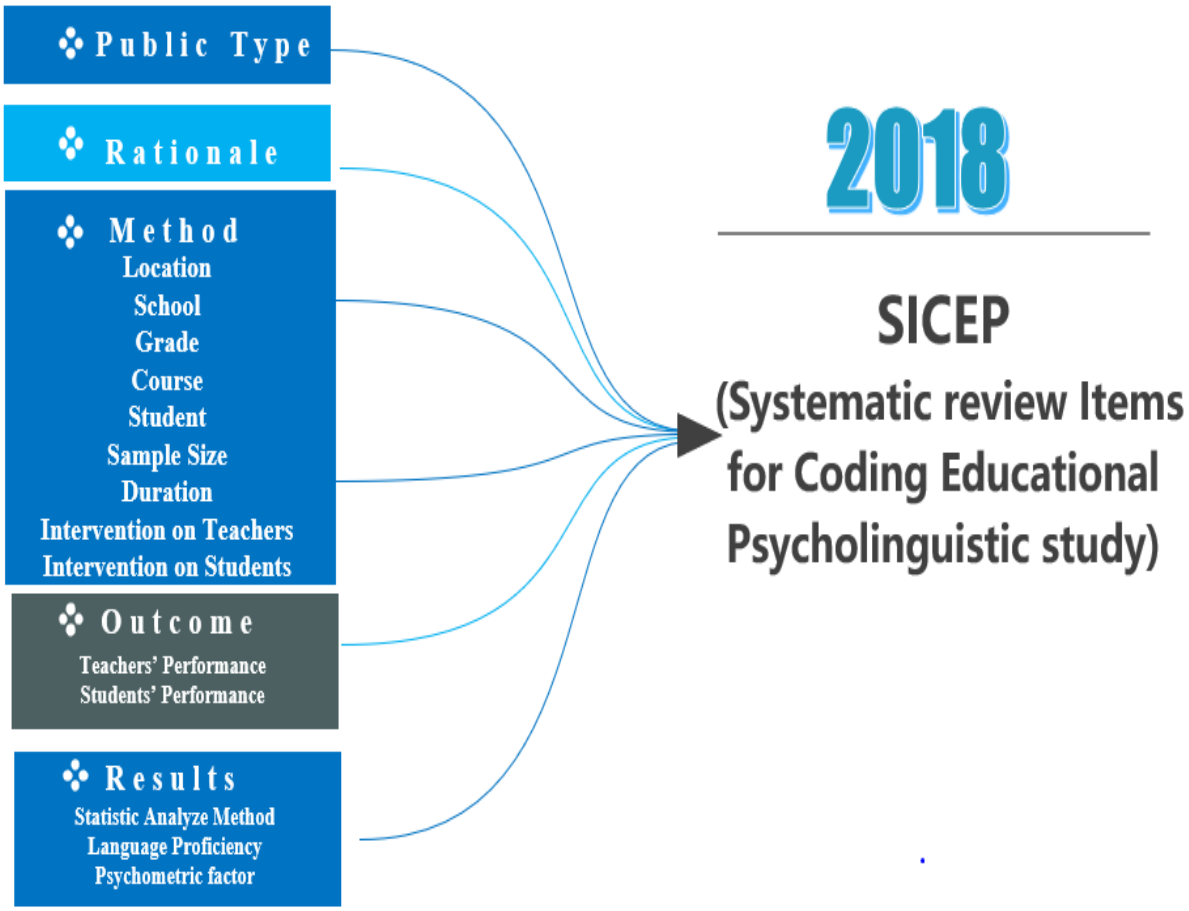

Figure 2. SICEP coding protocol.

Educational psycholinguistic is an innovative discipline proposed by the author, engaged in connection between learners' psychologic status and subject learning achievement under the non-native language guidance of adult instructors. Therefore, the SICEP protocol can acclimate educational, psychological or linguistical research's coding. The coding table consists of: (a) rationale (theoretical foundation of research); (b) location (the country that research conducted); (c) school type; (d) grade level; (e) course (the specific course students took); (f) student type (EL means students living in English speaking country, ESL are students living in non-English native language country); (g) sample size (the number of participants); (h) duration (the total days the intervention last); (i) intervention on teachers (if researchers cultivate teachers' teaching skills via any forms of professional development); (j) intervention on students (what experimental teaching strategies students were exposed to); (k) measurement of teachers' performance; (l) measurement of students' performance; (m) analytic method; (n) effects on students' language proficiency; (o) effects on students' psychometric development (e.g. self-confidence); and (p) public type (e.g. thesis, journal article).

Data Exaction

Selected articles were coded under self-designed guideline SICEP protocol, which is a scientific reporting format used for conducting systematic review in the field of educational psychology. The teaching strategies and researcher methods covered by 11 empirical studies as well as analysis method can be seen in Table 2. The research methods covered by 11 empirical studies can be seen in Table 3. Specific SICEP coding information recording rationale, method, outcome, records of empirical studies coding can be seen in APPENDIX B.

Table 2

Teaching Instructional Scaffoldings Identified in 11 Empirical Studies

Order	Author	Year	Teaching Strategies						
			Affective training	Audio & Video	Cooperative learning	Leveled Question Scaffolding	Mixed-coding	Teacher's question	Vocabulary Exercise
1	Fernandez	1992			●				
2	Allen	1993			●				
3	Vianna	1994							●
4	Klingner & Vaughn	2000			●				
5	Carrier	2003		●					
6	Cuestas Cifuentes	2006		●					
7	Kennedy	2008		●					
8	Kim	2010						●	
9	Lara et al.	2012				●			
10	Jiang et al.	2014					●		
11	Mostafavi & Vahdany	2016	●						

Table 3

Research Methods Identified In 11 Empirical Studies

Order	Author	Year	Research Method		
			Experimental Study	Quasi-Experimental Study	Case Study
1	Fernandez	1992		●	
2	Allen	1993		●	
3	Vianna	1994		●	
4	Klingner & Vaughn	2000		●	
5	Carrier	2003		●	
6	Cuestas Cifuentes	2006			●
7	Kennedy	2008		●	
8	Kim	2010			●
9	Lara et al.	2012	●	●	
10	Jiang et al.	2014		●	
11	Mostafavi & Vahdany	2016	●		

Effective English Oral-Language Instructional Scaffolding Strategies

Oral interaction is the most important index that appraises whether the strategy involves EL students' oral language practice. The teacher-centered oral interaction was defined as "teacher interacts with all students in class"; "teacher interact with some students in one group in class"; the students-centered oral interaction was defined as "students study individually under teacher's supervision" and "students work in groups under teacher's supervision" (Antón, 1999, p. 311). The strategies include those four characteristics were calculated as valid resources to obtain the final results with 7 instructional strategies with K-12 ELs.

Affective training was applied among 60 Iranian female students by Mostafavi and Vahdany (2016), who conducted a true experimental design by randomly selecting 30 high-school students as treatment group and 30 high-school students as control group. The affective training refers to teacher's choice of positive affective activities as oral language practice, such as positive self-talking, relaxed joke, and emotional encouragement. Statistic results show there is a significant difference between control students and treatment students in that students in treatment group performed better than control peers in Oral Communication Assessment Scale post-test.

Audio & Video techniques can be used to promote students' English production. Carrier (2003) implemented a listening intervention study by adding video clips such as movies or speech into instruction. After 6 weeks, high school students from the U.S. rural school demonstrated stronger oral comprehension skills from pre-test to post-test. Similarly, music is believed to be as an effective tool for EL instruction (Schunk, 1999). For example, Cuestas-Cifuentes (2006) proposed to use music and English songs to help students practice English language. In this teaching mode students were required to choose one song and learn new words

and rhythm from its lyrics, then discuss its topic and theme. The author found that students became more skillful to orally express their idea, and spoke more clearly, quickly, and confidently. Kennedy (2008) selected 9 Hispanic kindergarten students in regular public school as control group and 9 kindergarten Hispanic students in after school program as treatment group who received 30 minutes music therapy every week. They learned English expression through chanting, rhythm, singing and lyrics. After 10 weeks, the 7-item English speaking checklist report showed that treatment students speak more frequently and clearly, talk loudly with confidence or stay focused on topics, suggesting that they feel more relaxed in English self-expression compared to control students.

Cooperative learning is one of the most commonly used teaching strategies across forty years span; it was believed to involve students directly in oral interaction in class. Teachers are highly recommended to create cooperative learning environment for EL students from diverse cultural background because these students need opportunities to engage in non-primary language context (Vineyard, 2010). The cooperative learning can be designed by different functional methods; a common method is peer group-study, which helps students expand oral vocabulary, enhance confidence, and promote English communication. For example, Fernandez (1992) implemented an intervention study among 21 rural school EL students in the United States from Kindergarten through fifth grade. The researcher provided workshop to in-service teachers and scaffolded 30 minutes cooperative group activities among participating students. The post-test demonstrated that on average students increased by 25% of their verbal English proficiency. Allen (1993) designed the intervention program which group students in pairs and act role-play under simulate scene, such as act to learn “how to talk with sales person”. After 4 weeks’ intervention the author found the intensive teaching program is positive to build

rewarding and effective student-center mode. Klingner and Vaughn's (2000) research also confirmed that EL students in one class can help each other complete class assignment more efficiently if working in small, heterogeneous group. They did intervention study of collaborative strategies teaching among 37 fifth grade students in the United States, teachers were trained to organize EL students into small, cooperative groups to facilitate each other's oral reading task. After 4 weeks' intervention, students showed productive high-level engagement in class.

Mixed-coding means combining students' first language (L1) into second language (L2) based class to promote students' utterance in both languages. For example, use high frequency English words "Obviously" instead "*xian ran*" in Chinese sentence. Jiang et al. (2014) observed a Mandarin-English bilingual program for seven months and recorded teachers' discourse and students' performance when L1-L2 code-switching strategy applied. He found when students convert speaking between two languages, they learnt cross-cultural vocabularies, expression as culture from L2.

Teacher's question is proved to be another effective method that can be adopted to develop EL students' oral language proficiency. Researchers have found that asking questions can help teachers check students' comprehension frequently and provide EL students opportunity to speak out (Wrigley, 2001; Kim, 2010). Kim (2010) stressed that teachers' questions are important to help transitional bilingual learners think deeply about the texts they read so that transform their reading experiences into actions. The researcher found that asking questions can help teachers check students' comprehension and provide EL students opportunity to speak out. The researcher conducted a one-year case study and took detailed observation notes of 9 upper elementary student's performances by the end of semester. He classified questions into three types and collected data based on classroom interview of three Korean-English bilingual

elementary school classrooms and concluded that coaching questions could be used to give students command, facilitating questions could be used to stimulate students' deep thought, and open-ended collaborating questions could be used to help students practice oral communication through conversation.

Leveled question scaffolding was upgraded from teachers' questions, it was designed based Bruner's (1978) instructional scaffolding theory and Lara-Alecio and Parker's (1994) bilingual pedagogical theoretical model and has been applied in both quasi-experimental and experimental design. In 2012, researchers applied QS for teaching state-mandated science and reading instruction among 166 treatments fifth grade ELs, another group of 80 fifth grade ELs were chosen as comparison group. At students' level, in order to develop English oral language and correct misconceptions, QS was designed into intervention curriculum activity, which combined "(a) randomness, (b) quick write, (c) pair-share, (d) choral response, (e) visual cues, and (f) timed thinking" (Lara-Alecio, Tong, Irby, Guerrero, Huerta, & Fan, 2012, p.11). In order to upgrade students' academic ability in science and reading, QS was scripted with cognitive content such as "identify, describe, explain, analyze" (Lara-Alecio, Tong, Irby, Guerrero, Huerta, & Fan, 2012, p.9). Beyond, at instructors' level a bi-weekly teaching workshop were carried out for communicating teaching materials and opinions. The QS was also applied in an on-going experimental project ELLA-V (Lara-Alecio, Irby, & Tong, 2012), the effects of QS among Grade 1 participate ELs collected in 2016 are under evaluating by Teacher Observation Record (TOR) and WMLS-R measurements.

Vocabulary exercise is a direct way that can help EL students improve oral English. Vianna (1994) found students at Brazil English language school do not speak English fluently because they have limited size of vocabulary. Therefore, he improved students' oral English by

practicing communication naturally with specific vocabulary items. More specifically, he provided students in-text vocabulary test before they learned new text. Then according to the test scores, students practiced their new vocabularies via in-class English communication. For example, each student was assigned a picture, with one student describing the content and other guessing the word meaning. Results showed that 1the 2 Brazilian intermediate-level students acquired higher level of oral English performance and gained confidence through expanding lexicon via vocabulary exercise.

There are also some newly designed teaching strategies based on teachers' personal experience. For example, Lam (2010) designed a non-targeted strategy based on Meta-cognition theory. The researcher conducted an experimental study on two randomly-selected secondary classes— one was observed as control class another one was chosen as treatment class (both with students who aged about 13 to 14). treatment classes were given the instruction in the development of metacognitive non-target strategy including "Enhancing task knowledge" (speaker tries to understand the nature in discussion same as understanding the context in discussion), "check meanings" (speaker tries to understand the meaning of words for an upcoming discussion). The coding results show that treatment class applied metacognitive non-target strategies more frequent over time, and the strategies facilitate the group discussion task same as the traditional target such as problem-solving, so teachers should direct learners' attention not just to strategies targeted for learning. But this strategy may be more applicable for students at secondary schools because children think abstractly utilizing metacognition at age 11-16 (Piaget, 1965; Santrock, 2004). Barr et al., (2012) considered providing the independent chance for EL students, sometimes teachers can let students choose which content they prefer to learn through wide learning materials and learn the words incidentally. A newly instructional

scaffolding trend is computer-based learning. Burstein, Shore, Sabatini, Moulder, Holtzman, & Pedersen (2012) developed an instructional application called Language Muse, it is a web-based application can support teachers design different styles lesson plan by describing the curriculum standards, engage student background knowledge and interest or specify formative and summative assessments.

Discussion

In this study, I synthesized 467 articles by setting criteria "EL", "Oral English proficiency", "instructional scaffolding" and accomplished coding through the educational psycholinguistic review guidance SICEP to report 7 effective teaching strategies, which can help improve K-12 EL students' oral English proficiency based on extracted 11 empirical studies The effective teaching strategies include: Affective training, Audio & Video exercise, Cooperative learning, Leveled question scaffolding Mixed-coding, Teacher's question, and Vocabulary Exercise. Included empirical articles equipped with a set of idea includes concepts, assumptions, generalizations which intended to explain phenomena or provide the framework to the knowledge base in one field or more fields (Kollros & McMurray, 1955). Therefore, these teaching strategies all have reference value according to their scientific empirical evidences while not mentioned based on personal teaching experience without strong theoretical background. Those empirical studies involved approximately 200 students in total associated with 7 countries, 10 grade levels and various ages range from 6-17 years old. The extracted 7 strategies were designed for teachers to improve K-12 ELs' oral English proficiency in virtue of increasing their classroom involvement, oral expression comprehension skills, interaction with teachers or peers, learning interests as well as self-confidence.

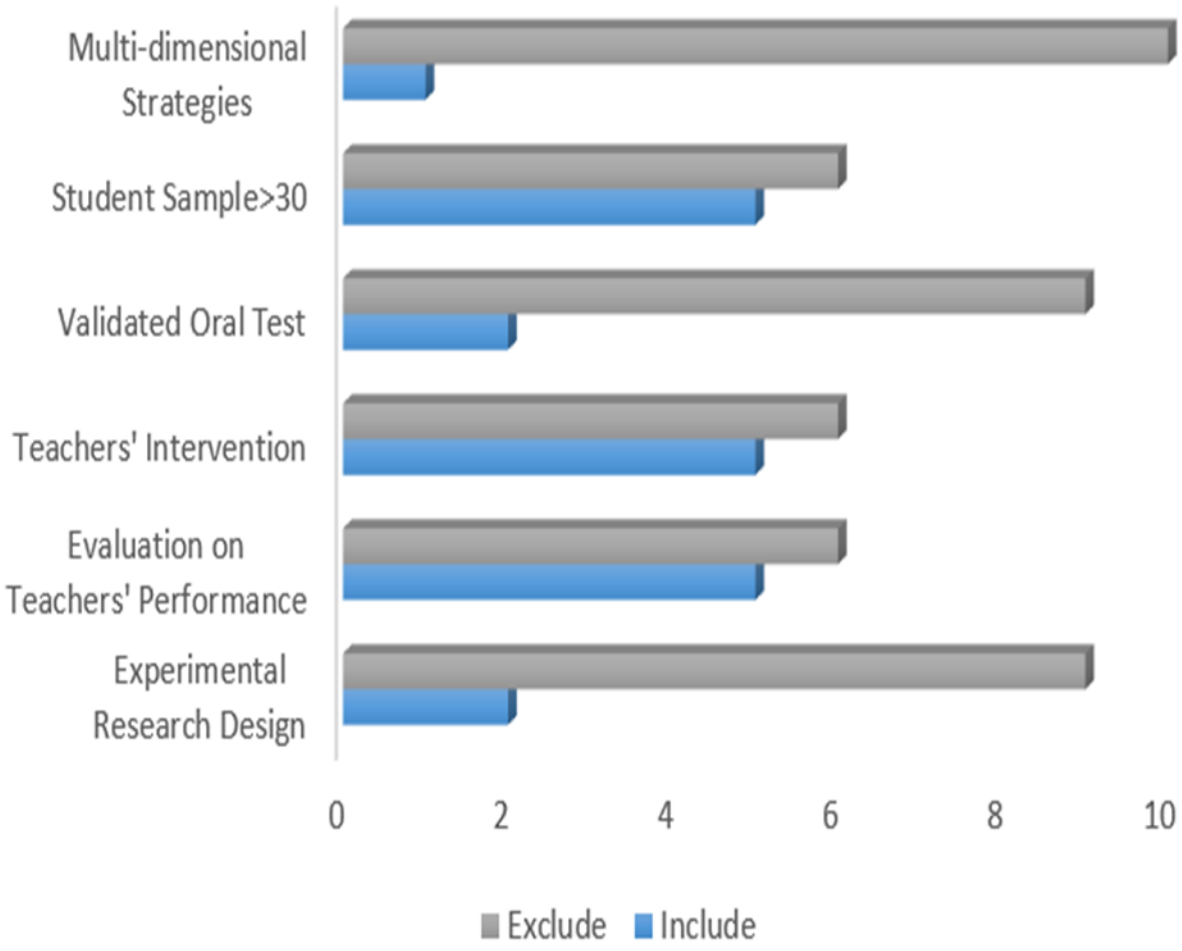

Figure 3. Quality report of 11 empirical studies.

On the contrary, the SICEP coding also revealed some limitations remaining in current literature (See Figure 3).

First, there is an insufficient number of experimental research design. A proper experiment to be interpretable requires drawn samples are randomly assigned to diverse groups or treatment controlled all extraneous variables (Campbell & Stanley, 1963). While only 2

studies ever implemented their teaching strategies in true experimental design (Lara et al, 2012; Mostafavi & Vahdany, 2016); Other 7 studies were realized in quasi-experimental design (Allen, 1993; Carrier, 2003; Fernandez, 1992; Jiang et al., 2014; Kennedy, 2008; Klingner & Vaughn, 2000; Vianna, 1994), without controlling all other factors that might affect outcomes, or researchers only assign individuals to one treatment group but there is no control group receiving intervention as contrast; 2 studies are case studies, researchers evaluate strategy bounded with specific students and activity via a non-experimental form, which collected and analyzed through sustained contact or interview with participants (Cuestas Cifuentes, 2006; Kim, 2010);

Second, the sample size in most studies is finite. Ten studies include participating students ranging from 9 to 60, and they were collected from a class or one school. The sample is quite limited in size and not widely representative (Allen, 1993; Carrier, 2003; Cuestas Cifuentes, 2006; Fernandez, 1992; Jiang et al., 2014; Kennedy, 2008; Kim, 2010; Klingner & Vaughn, 2000; Mostafavi & Vahdany, 2016; Vianna, 1994). Appropriate sample size should be considered in estimation of statistical significance to avoid Type I error, and to detect effect size (Cohen, 1988). For linear multilevel models, level-2 units should range from 6 to 100 , level-1 units are suggested at least 30 by most cited guidelines with at least 10 groups for accurate fixed effects and standard errors (Maas & Hox, 2005; Pacagnella, 2011).

Third, the intervention of teachers is neglected. For example, 6 researchers focus on students' intervention without coaching teachers' teaching skills as parallel intervention (i.e., Vianna, 1994; Carrier, 2003; Cuestas-Cifuentes, 2006; Kennedy, 2008; Jiang et al., 2014; Mostafavi & Vahdany, 2016). Accordingly, studies without professional development do not include measurement of teachers' performance;

Fourth, there is a lack of measurement of students' performance. More specifically, 9 adopted self-reported test without validated measurement protocol to test students CALP language proficiency (i.e., Allen, 1993; Carrier, 2003; Cuestas Cifuentes, 2006; Fernandez, 1992; Jiang et al., 2014; Kennedy, 2008; Kim, 2010; Klingner & Vaughn, 2000; Vianna, 1994). EL students may only have the chance to practice oral English in the process of interacting with classmates or teachers at school (Fillmore, 2000), they should have specific individual test to test their second language proficiency.

Finally, I found an isolation of teaching strategy. Except leveled question scaffolding (Lara et al., 2012), all other researches choose one type of strategy as one major object of observation, and evaluate its effects restricted in solely cognitive domain, which makes the strategy difficult to be popularized.

Based on previous findings, a superior empirical study focuses on exploring effective instructional scaffolding should conduct an experimental study, include enough participates, emphasize intervention on both students and teachers, and evaluate students' performance by personalized tests. Therefore, leveled question scaffolding (Lara-Alecio et al., 2012; Tong et al., 2017) displays the best characteristics that can function as a multi-dimensional synthesized teaching strategic system. The leveled question scaffolding strategic model combines teachers' strategies such as leveled questions, random selection strategies, cooperative learning, hint-clue, time-gaining, affective feedback, cognitive feedback, etc. It also realizes professional development as intervention among teachers and test students' cognitive academic English oral proficiency by validated test WMLS-R. It has been examined in an experimental study meanwhile proposed to be conducted in an experiment research (Lara-Alecio et al., 2012).

In 2016, it was adopted in a RCT project among Grade 1 Hispanic-English ELs across seven school districts in Texas, which aims to scaffolding content more effectively to enhance students' English CALP ability. In addition, to guarantee its' implementation, a professional development intervention was conducted among participate treatment teachers.

Conclusions

For sake of discovering what kinds of teaching strategies can be referenced for promoting EL students' oral language proficiency, in this study, I did a systematic review among 467 researched results, 11 empirical articles were included for in-depth full-text review which most closely in the criterion of "instructional scaffolding", "EL students" and "oral language proficiency". This study contributes 7 effective instructional scaffolding or teaching strategy that were extracted from included empirical studies, which have been tested in scientific procedures and can be applied widely to improve EL students' oral proficiency. Besides, 5 risk of bias were suggested to be overcome in following research. The quality of the systematic review was evaluated by PRISMA. A 27-item checklist normed by PRISMA guideline was reported to test the quality of current systematic review (see APPENDIX A).

Among the synthesis of 7 teaching strategies, in the following section of this dissertation study, I would retrieve data from a large-scale RCT and investigate the most complex multi-dimensional instructional scaffolding---leveled question scaffolding in following chapter.

CHAPTER III

THE EFFECTS OF TEACHERS' UTILIZATION OF LEVELED QUESTION SCAFFOLDING ON FIRST GRADE ENGLISH LEARNERS' COGNITIVE ACADEMIC ORAL ENGLISH PROFICIENCY: A HIERARCHICAL LINEAR MODELLING APPROACH

Overview

In this article I examined (a) the effects of one-year virtual professional development intervention on EL teachers' leveled question scaffolding strategy application; and (b) the effects of EL teachers' leveled question scaffolding strategy application on students' oral language ability. Findings indicate that one-year virtual professional development intervention effectively enhanced EL teachers' application of leveled question scaffolding strategy, which improved ELs' English oral language proficiency significantly. Findings from this study are expected to provide constructive guidance to school administrators, educators, and teachers so as to better support EL children's oral English development.

Introduction

In the recent decade, the rapid growing number of English learners (ELs) in the United States brings new challenges for researchers and educators. According to the US Census Bureau report (2010), the EL population is over 80 million and increased by 32.75 % on average from 2000 to 2010, in which Hispanic ELs accounted for more than 50 million. In Texas where this current study took place, the percentage of public school students who participated in programs for students identified as ELs in 2016-17 was 18.86%, which is 6.2% higher than the national average (Texas Education Agency [TEA], 2017).

It is noteworthy that in a long-term, EL students are reported falling behind native English speakers due to lack of English proficiency (Chapa, 2013; Goldenberg & Wagner, 2015; Irby et al., 2008). Such academic gap between ELs and non-ELs continues to widen. For example, according to Texas Academic Performance Report on all school subjects 2015-16 (NCES, 2017) with students' school records at entire state level across all grade at elementary schools, only 57% EL students were performing at satisfactory level in academic reading, lower than the state average (75%), and much lower than White students with 85%. As one essential indicator of academic language proficiency, oral language acts as a basic conversational skill during social communication, meanwhile reveals personal academic language proficiency (Anthony, 2008; Pham & Humid, 2013).

My systematic review in Chapter II summarized research in the field of effective teaching strategies over the past forty years and identified characteristics on how to improve teaching quality that promotes ELs' linguistic and cognitive oral proficiency. Among various effective teaching strategies, QS strategy was proved an effective instructional scaffolding to facilitate the ELs' cognitive academic learning and VPD is a functional approach to upgrade QS practical degree. In this chapter, I utilized data retrieved data from a RCT project and to search for empirical evidence of whether the QS teaching strategy is effective on developing EL students' English oral cognitive academic language in elementary school.

Purpose of Research

This is a quantitative study with data retrieved from a five-year large-scale intervention project supported by federal grant, project English Language and Literacy Acquisition – Validation (PR/Award Number: U411B120047). The purpose of project ELLA-V is to

investigate the effects of instructional intervention with virtual professional development on native Spanish-speaking ELs' English language acquisition. In this study I analyzed data collected from 464 first grade students from 3 school districts in Texas to explore whether the use of leveled questions scaffolding (QS) can improve first grade EL students' English oral language proficiency and if the virtual professional development (VPD) intervention on EL teachers can help teachers master this strategy and apply more frequently in their instruction. The research questions are as follow:

1. Do teachers' leveled questions scaffolding (QS) usage predict first grade EL students' cognitive academic oral English performance?
2. Does one-year virtual professional development (VPD) intervention increase treatment teachers' usage of QS strategy?

Literature Review

Leveled Question Scaffolding

Leveled question scaffolding (QS) is reported to positively impact ELs' oral language development. It was designed based on Piaget's (1961) genetic epistemological cognitive development theory, Vygotsky's (1964) sociocultural zone of proximal development (ZPD) theory and Bruner's (1978) instructional scaffolding theory and Lara & Parker's (1994) Four-Dimensional Transitional Bilingual Pedagogical Theory.

Piaget (1961) divided children's cognitive development into four stages, children formed language and cognition from symbolic functions to meta-cognitive stage. In the area of social psychology, Vygotsky promulgated this field between learners' lower and higher cognition as zone of proximal development (ZPD). In the ZPD field, social interaction from instructors plays

a critical role of cognitive transmission (Vygotsky, 1964). Figure 4 shows how reciprocal instruction works for learners.

Figure 4. Zone of proximal development.

Piaget's (1961) genetic epistemological cognitive development theory and ZPD theory convince adults should positively interact with children (who can then achieve something beyond their individual efforts), as well as adjust the level of support to suit the cognitive potential level of the child (See Figure 5).

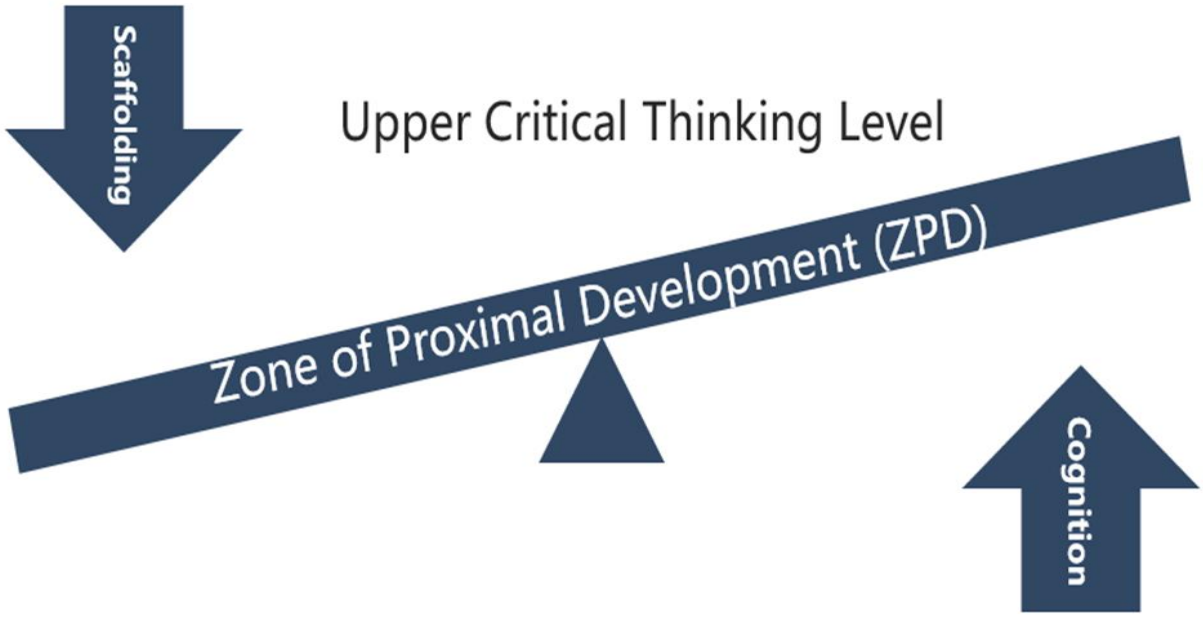

Figure 5. Instructional scaffolding.

According to Bruner's (1978) notion, the reciprocal support from students' instructors was defined as instructional scaffolding, which means instructors provide sufficient support for learners to get their learning goals (Bruner, 1978; Ninio & Bruner, 1978). For example, teachers

adopt actions, verbal instruction as strategies to support students transfer from preoperational stage to concrete operational stage, (Woolfolk-Hoy, 2004), from lacking concrete logic to manipulate information mentally, or towards recognizing basis of objects, hypotheses or propositions (Nolen-Hoeksema, Fredrickson, Loftus, & Lutz, 2014).

To promote teachers' social interaction with students, Lara-Alecio (1994) developed a pedagogical model for transitional bilingual English classroom, in which "activity structure" layer requires teachers' communication with students via activities when scaffolding curriculum content (See Figure 6), which different from traditional lesson content-centered mode.

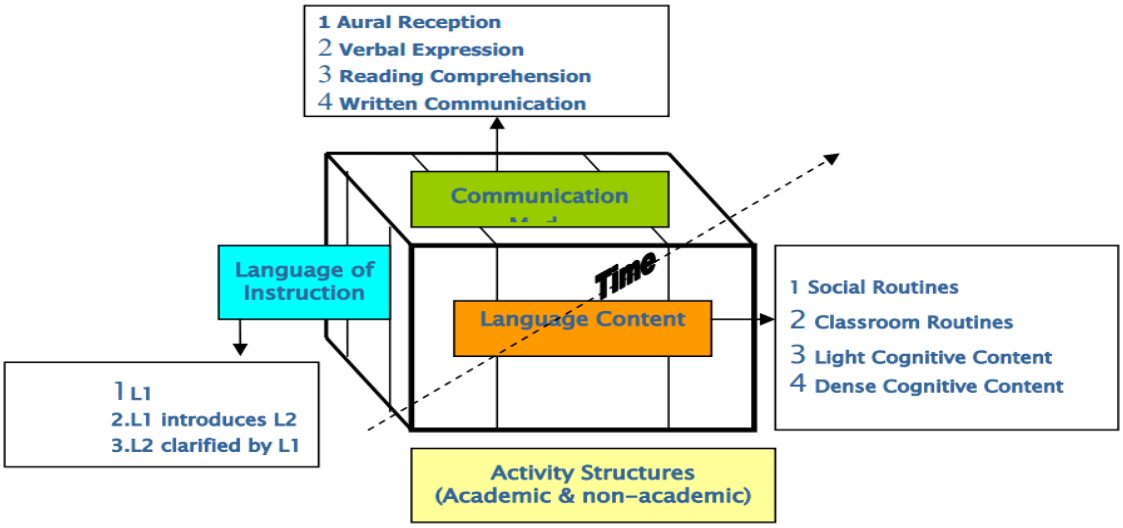

Figure 6. Transitional bilingual observation protocol. Reprinted with permission from "Teachers' pedagogical differences among bilingual and structured English immersion kindergarten classrooms in a randomized trial study" by Rafael Lara-Alecio, Fuhui Tong, Beverly J. Irby, et al., 2009. Bilingual Research Journal, 32, Pages 77-100, Copyright [2018] by Taylor & Francis.

As requirement of Activity Structure dimension based on transitional bilingual pedagogical theory, leveled question scaffolding (QS) is one effective and synthesized EL teaching strategies, which aims to improve ELs' literacy skills as well as an oral communication by combining leveled questions, random selection, pair-share, clue hint, time gaining, simultaneity and give students cognitive feedback, etc. In the process of QS, teachers are motivated to monitor students' cognitive academic language comprehension meanwhile find the evidence to support their responses by asking the scripted leveled question (Tong et al., 2017) (See Figure 7).

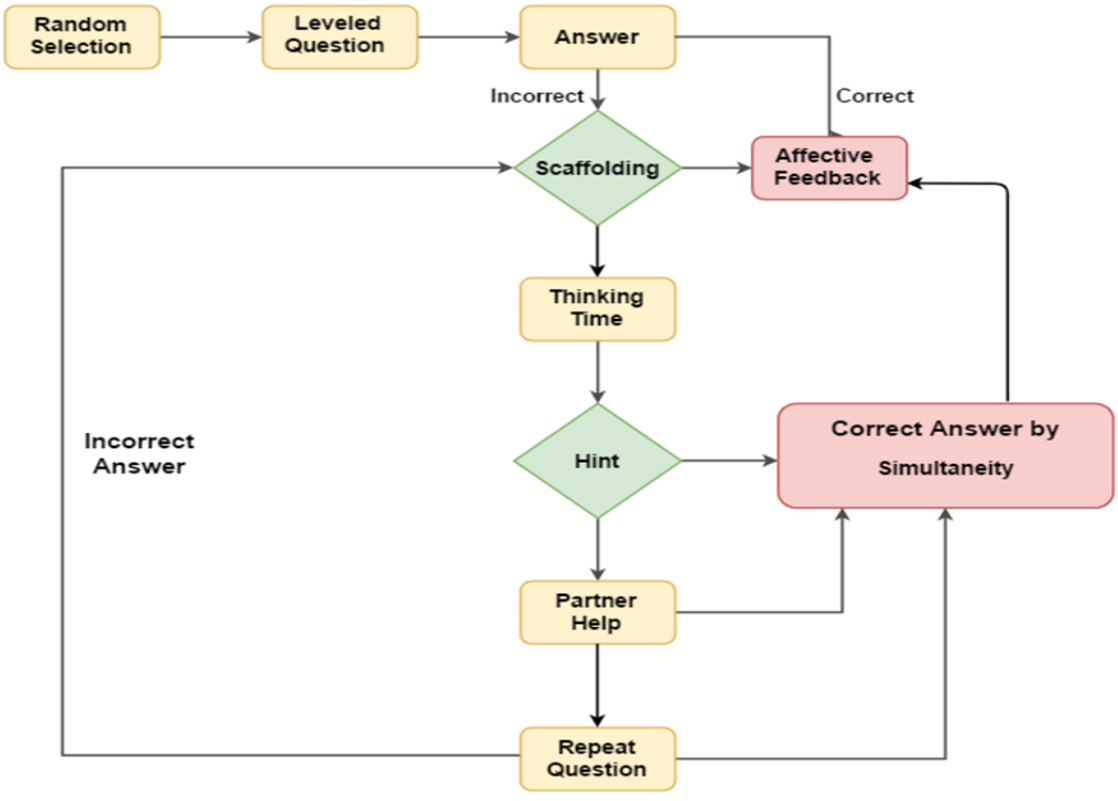

Figure 7. Leveled questions scaffolding flow chart.

Virtual Professional Development

PD shaped teachers' instructional practices, systematic review in chapter II presents that there is a need to provide quality PD for teachers to develop and familiarize themselves with scaffolding (Allen, 1993; Fernandez, 1992; Kim, 2010; Klingner & Vaughn, 2000; Lara et al., 2012). Professional Development means using specific techniques to adopt proper training that equipping teachers with a well-structured and skillful teaching practices or engaging teachers fitting standard capacity requirement (Guskey, 2001; Kennedy, 2016; Little, 1993). As an indispensable component of quality instruction, professional development has been proved to make contribution to ameliorate teachers' teaching quality. Lara-Alecio et al. (2009) observed 54 kindergarten teachers in Texas English-immersion program classes and found experimental teachers who received PD intervention allocated more instructional time on cognitive field knowledge and effective ESL teaching strategies such as leveled question scaffolding or visual scaffolding (VS) during teaching. Tong et al. (2017) built and tested a conceptual model among PD, quality instruction and EL's advanced academic language achievement. 22 teachers in treatment group were proved spending more class teaching time in scaffolding cognitive content for higher level students' engagement. The Virtual Professional Development (VPD) is the professional development based on online coaches. During ELLA-V intervention at teachers' level, researchers provide VPD through online software such as Citrix GotoMeeting and ThereNow classroom observation (Corcoran, Ross, Irby, Tong, Lara-Alecio, & Guerrero, 2014).

EL's Cognitive *Academic English Oral Language Proficiency*

Cummins (1979) identifies dichotomous EL's language proficiency as cognitive academic language proficiency (CALP) and basic interpersonal communicative skills (BICS),

those two language acquisition terms distinguishing EL students' higher- and lower- ranking language acquisition. BICS refers to "conversational fluency in a language", while CALP denotes "students' ability to understand and express, in both oral and written modes, concepts and ideas that are relevant to success in school" (Cummins, 2013, p. 65). Although BICS is at lower cognitive level dealing with informal communication and CALP is at higher order thinking level dealing with academic subject content, both skills are required in school education (Cummins, 1981; Manyike, & Lemmer, 2011).

Method

Research Design

Current study is retrieved from a randomized controlled trail (RCT) validation study designed for improving Hispanic-English speaking children's English CALP ability across Texas. The English Language and Literacy Acquisition—Validation (ELLA-V; Lara-Alecio, Irby & Tong, 2012) aims to examine the efficacy of previous RCT Project English Language and Literacy Acquisition (ELLA) which was conducted from 2003 to 2007. ELLA investigated the efficacy of two types of bilingual instructional program, structured English immersion (SEI) program and transitional bilingual education (TBE) in the process of the aching Spanish-speaking kindergartener's English language. ELLA-V project validate impact of ELLA intervention and determine the effects of one-year intervention has on Hispanic ELs' oral language, reading or science skills from kindergarten to third grade respectively. In Project ELLA-V, schools were randomized assigned to two different treatments or control. In this study, students from treatment 1 and control were included in the analysis.

Participants

According to the newest report NCES in 2015; the percentage of EL students was generally higher in school areas which are more urbanized, such as cities and suburbs. Therefore, in current study, school samples from three representative types of Texas Independent School Districts (ISD), including one major urban district located in a county with more than 200,000 students, one major suburban district with about 35,000 students and one central city with about15,000 students. Besides, the amount of lower grade elementary EL students is much greater than amount of public school students in in upper grades (NCES, 2017). Therefore, at students' level, the data of this study were retrieved from first-grade students participating ELLA-V Project during the school year of 2015.

Intervention

There were two levels of intervention. Level I is direct intervention for EL students, via 28 weeks enhanced ESL instruction- Story reTelling and higher order thinking for English Language and Literacy Acquisition (STELLA) combined with Academic Oral and Written Language in Science (AOWLS) (Lara-Alecio et al., 2012). The treatment was implemented within 45-minute block daily. STELLA was developed to integrate language and content literacy skills, which means it combines ESL teaching strategies with higher order leveled questions, such as applied academic vocabulary in the content area of science and provided opportunities for students to practice language via story retelling, as well as included training for the teachers on a biweekly basis (Irby et al., 2008).

Bilingual school teachers and students in the control group were involved as comparison remaining their original learning and study method and received no intervention. Students in control group school received 45 minutes typical ESL instruction daily.

AOWLS helps students improve oral language and listening comprehension as well as academic science vocabulary, the curriculum lasts 35 minutes aligned with Texas Essential Knowledge and Skills (TEKS) science vocabulary. It is related to science topics involved in STELLA books. AOWLS is aligned with English Language Proficiency Standards (ELPS), TEKS-science, Next Generation Science Standards (NGSS) targets at academic vocabularies and provides sentences applying words in context (Lara-Alecio et al., 2012).

Level II is teachers' development, via a structured intervention of bi-weekly virtual professional development (VPD). Teachers in the treatment group were provided virtual classroom observation and virtual live coaching to treatment ESL teachers which can improve their teaching skills. Each teacher in treatment bilingual class was offered virtual professional development (VPD) biweekly included practice and review class content, ESL instructional strategies, oral language and literacy development, communication mode, etc. VPD was delivered by synchronous with facilitator, asynchronous with facilitator, or asynchronous without facilitator (Tong, Irby, & Lara-Alecio, 2016). For example, treatment teachers were trained to perceive how to use scripted lesson plans for academic vocabulary instruction, how to apply leveled question strategy to improve students' listening comprehension or oral language development. They were provided the continuous workshop in the sum of 6 hours one month and 50 hours in one school year via Citrix Go to Meeting. Video cameras were embedded in each classroom record videos for class observations and evaluation (Tong et al., 2016).

Instruments and Data Collection

Leveled Question Scaffolding

Treatment teachers were trained to use the Leveled question scaffolding strategy, which combined students' involvement with leveled question.

Students involvement requires treatment teacher interact with students through: a) Partner work - two students talking/working together or pair-share their opinions in small groups; b) Simultaneity - all students have opportunity to respond to choral response, visual cues, or write/illustrate using whiteboards; c) Random selection - teachers call on students to answer questions randomly by using popsicle sticks, rather than selecting students who raise their hands.

Leveled questioning was designed for scaffolding EL students' cognitive academic English proficiency required by BICS and CALP. For sake of evaluating EL students' cognitive academic level, we can further link BICS and CALP to Bloom's (2001) revised Taxonomy, which has been long advocated as an evaluation of institutional quality (Cannon, & Feinstein, 2014). The multi-tiered taxonomy model contributes hierarchy classifications of learners' cognitive processes (Anderson & Krathwohl, 2001; Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). Surface level 1 of Bloom's revised Taxonomy stands for BICS skill, which demands basic concept without understanding. The level 2-6 of Bloom's revised Taxonomy stands for CALP skill, which involve comprehension, applying, analyzing, synthesizing and evaluating. Leveled Question inspire treatment teachers asking questions representing higher thinking skills level at Tier 2- Tier 6 cognitive levels of Bloom's revised Taxonomy and assist students in answering questions if needed (See Figure 8).

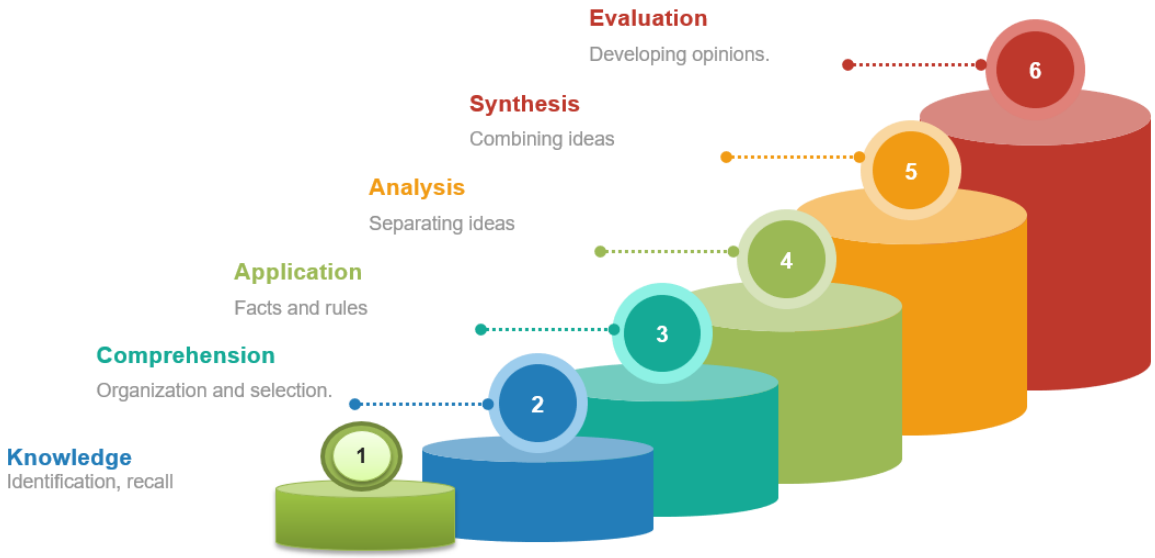

Figure 8. Bloom's revised taxonomy of cognitive domain.

If student cannot answer correctly, teacher should deliver scaffolding via (a) restating question or giving hints if students cannot answer; (b) interpreting or making a model sentence helping students understand; (c) offering students more time to think; (d) allowing students to discuss with other students; and (e) refer to instructional materials.

To sum up, leveled question scaffolding strategy refers to teacher ask leveled question and encourage students to actively participate and give equal opportunity for all students to respond. APPENDIX C is one scenario of QS practice.

Teachers' Performance Measurement

Teacher Observation Record (TOR) classroom measurement tool records and decodes teachers and students' interaction in details in an authentic education setting, which can be further applied to assist teachers to improve their instructional quality. TOR is designed based on Transitional bilingual observation Protocol (TBOP) theoretical model and targeted to measure teachers' instructional behavior. It scales teachers' instructional scaffolding in transitional bilingual class from nine aspects: 1) Teacher preparation, 2) Material preparation, 3) Pacing, 4) Student Involvement, 5) Teacher talking time vs. student talking time, 6) Leveled questioning, 7) ESL strategies, 8) Affective and cognitive feedback and 9) Physical environment. In which No.4 Student involvement and No.6 leveled questioning are two major indices of Leveled Question scaffolding as instructional strategy. All teachers' class activities and strategy application process were recorded and coded by experienced coders reaching moderate inter-rater reliability (IRR range from .48 to .62) through Survey Monkey online platform.

Students' involvement level and leveled question scores were combined as EL teachers' Leveled Questions Scaffolding (QS) strategy usage level, which evaluates whether teachers ask leveled questions, and apply random selection, pair sharing, visual cue, such question scaffolding strategy to enhance students' involvement. The degrees of QS levels are as below:

- 0%-25% degree: a teacher asks simple questions [Level 1 only], but does not scaffold when needed, lack of student involvement, no partner work, random selection, or simultaneity;
- 25%-50% degree: a teacher asks simple questions [Level 1 only], and scaffolds when needed, involve students at least one of the following: partner work, random selection, simultaneity;

- 50%-75% degree: a teacher asks leveled questions [Level 1 + another level(s)], but does not scaffold, lack of student involvement, no partner work, random selection, or simultaneity;
- 76%-100% degree: a teacher asks leveled questions [Level 1 + another level(s)], and scaffolds when needed, involve students at least one of the following: partner work, random selection, simultaneity.

Student Performance Measure

Woodcock-Muñoz Language Survey-Revised (WMLS-R) was chosen as the oral and reading English language measurements (Woodcock, Munoz-Sandoval, Ruef, & Alvarado, 2005). This is an individually administrated test with seven independent subtests that can be used for testing English proficiency in the oral language, language comprehension, reading, and writing (Sandilos et al., 2015). Each subtest measures cognitive-academic language proficiency (CALP). Testing content has increasing difficulty which is easier at beginning items and becomes more complex gradually.

To assess EL students' English oral language proficiency, Picture vocabulary (PV) test of WMLS-R was used to measure students' oral vocabulary and expression. It tests if students can associate technical vocabulary word with visual images and recall words' meaning then pronounce correctly. To administer this test, testers point to an objective on the picture, then let students speak out the word associated with that picture. For example, item 5 is a picture of cat, a tester would point the picture and ask, "what is this?", to be considered a correct answer, students should be able to speak out the word "cat" correctly. Oral language results clustered results of above two tests is highly reliable (reliability =.87 in testing age from 5 to 19; reliability=.92 in current study). Students at different grades need to start from the different

starting point, for example, first-grade students should start from former and easier items compared to third grade. Such individual starting point made the test more efficient based on the estimated ability of subjects. To calculate total points, each item will be scored as 1 point (correct response) or 0 points (wrong or no response). Grade-based scaled scores of WMLS-R were then calculated to reveal if students' success in English Cognitive-Academic Language Proficiency (CALP).

Data Analysis and Research Questions

The student level analytic sample consists of 218 treatment students and 246 control students. The teacher level analytic sample consists of 12 treatment teachers and 13 control teachers. Teachers' performance level on QS strategy were coded by three rounds of observation using TOR from the beginning, mid, and end of school year in first grade, with a total of 75 videos, 36 from treatment teachers and 39 from control teachers. The average length of observation was 49 minutes for each treatment teacher and 48 minutes for each control teacher. All recorded lessons were rated by trained TOR coder with moderate inter-rater reliability. At the school level, there are 6 treatment schools receiving virtual professional development (VPD) intervention and 7 control schools.

The data of this research are hierarchical, which means students nested within teachers who are in turn nested within school (Lower level units are nested within higher level units), so it is appropriate for building Hierarchical Linear Models (HLM) to reduce model overestimation (Raudenbush & Bryk, 2002). HLM software version 7 was used for the analysis. Students are the level-1 cluster and teachers are the level-2 cluster for conducting the (HLM). The Intra-class correlation of the HLM models was 0.10 (>0.059), which is an acceptable value (Cohen, 1988)

indicating that 10% of the variance in teachers' QS strategy level was due to within-teachers' QS strategy differences. Collected data information can be seen in Table 4.

Table 4

Description Statistics of Outcome Variables by Condition

Variable	Number	Mean	Standard Deviation
Level 1: Student			
PV-Pretest			
Treatment	218	45.75	29.43
Control	246	47.53	27.81
PV-Posttest			
Treatment	218	67.18	27.28
Control	246	60.74	26.58
Level2: Teacher			
QS strategy			
Treatment	36	0.79	0.16
Control	39	0.75	0.16

Research Question 1: Does teachers' QS usage predict first grade EL students' oral performance controlling for students' initial oral proficiency? Results in Figure 9 shows the trend that pre-test and QS strategy level can positively predict students' post oral test score.

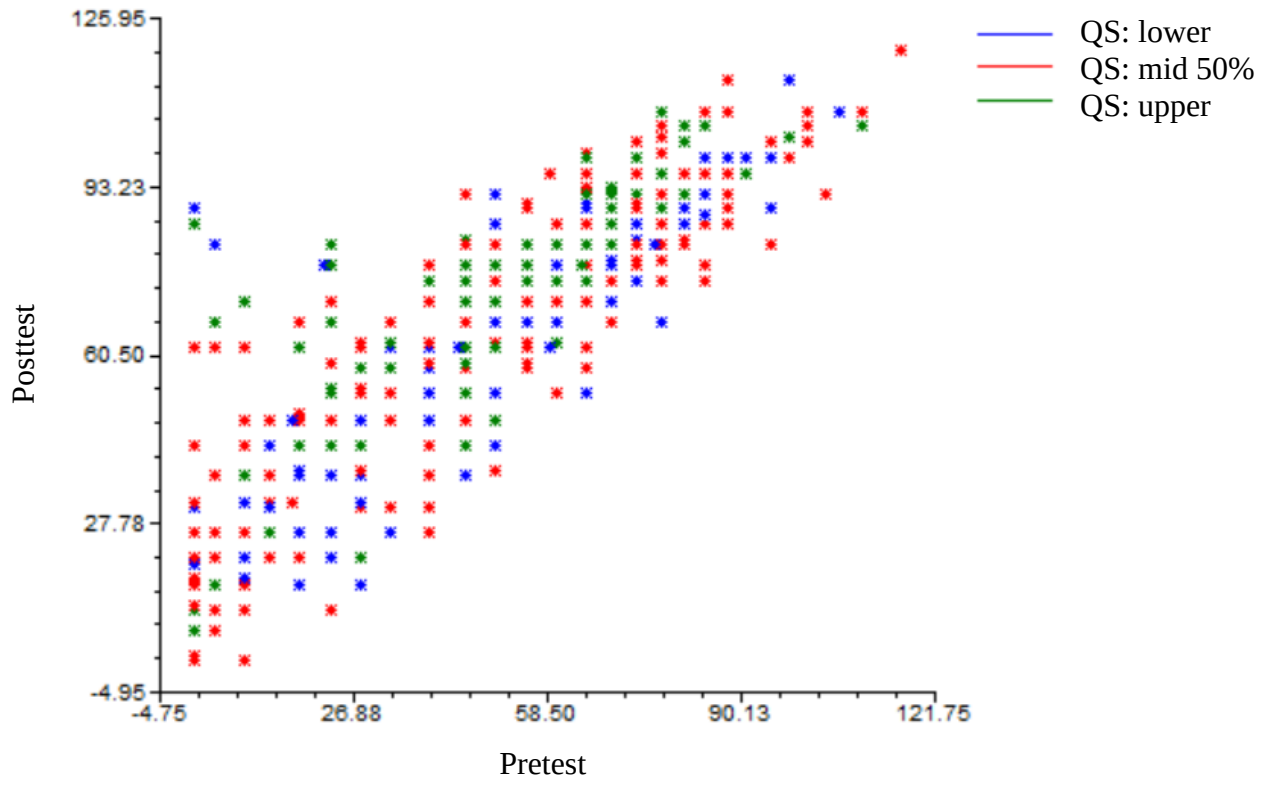

Figure 9. Effects of pre-test and QS strategy level on students' post oral test score.

Level-1 Model: $PVPOST_{ij} = \beta_{0j} + \beta_{1j}*(PVPRE_{ij}) + r_{ij}$

Where the *i* refers to student and *j* refers to teacher, the outcome measurement is student's PV post-test score, predicted by his or her PV pretest score. The mean PV post-test score of the jth teacher adjusted for PV pretest is $\beta_{0j.}$ The slope β_{1j} represents the effect of PV pre-test on PV post-test score. *rij* is the level-1 residual variance that remains unexplained after accounting for the covariates.

Level-2 Model: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(QS_j) + u_{0j}$

$\beta_{1j} = \gamma_{10}$

The adjusted mean of students' PV posttest is further predicted by the teachers QS teaching strategy in the level-2 model.

Mixed Model: $PVPOST_{ij} = \gamma_{00} + \gamma_{01}*QS_j + \gamma_{10}*PVPRE_{ij} + u_{0j} + r_{ij}$

Where the γ_{00} represents students' predicted PV post-test scores controlling their pre-test scores. γ_{01} represents main effects of QS strategy, γ_{10} represents main effects of students' PV pre-test. Results in Table 5 shows that the main effects of QS strategy ($\gamma 01$) were statistically positive significant for predicting students' PV oral posttest scores ($p<.001$). On average, controlling first grade EL students' initial level of English oral proficiency, gaining of 10% QS strategy degree was estimated to increase 2.11 points for EL students' oral language proficiency. The effect size of QS is 13% of a standard deviation with a 95% confidence interval of [5.26, 36.25]. The effect size is acceptable because according to previous systematic review, there is no homogenous study ever report an effect size.

The model graph equation is shown in Figure 10. It displays the regression-adjusted group means for the oral post-test score by QS coding score. There is a significant positive impact of using QS strategy.

Table 5

Parameter Estimates of Model 1

Fixed effects	Coefficient	Standard error	t-ratio	*df*
Intercept ($\gamma 00$)	9.07*	4.3	2.27	23
PV pretest ($\gamma 10$)	0.81**	0.02	32.06	415
QS Strategy ($\gamma 01$)	21.1**	5.16	4.42	23
Random effects	Standard Deviation	Variance	*d.f.*	$\chi 2$
σ_u^2 （Student level）	2.59	6.69*	23	37.47
σ_e^2 （Residual）	13.43	180.44		

*$p < .05$

**$p < .001$

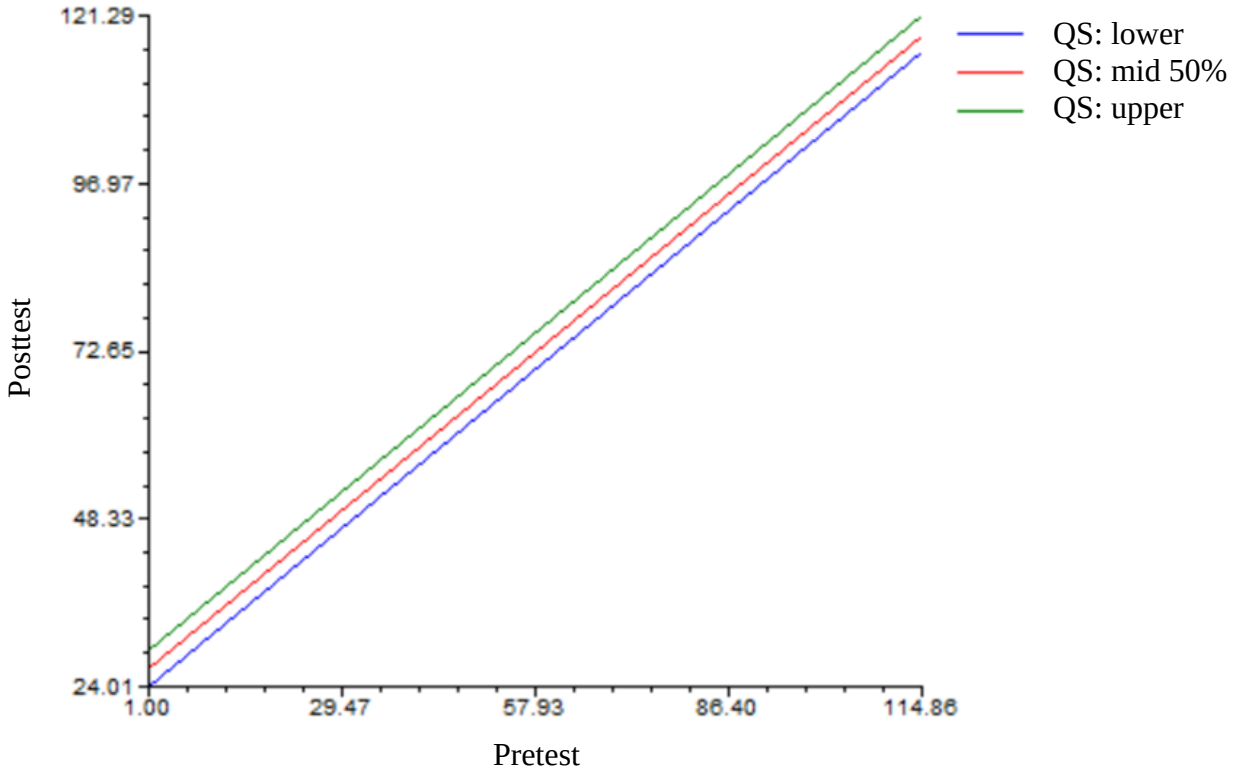

Figure 10. Graph equation of model 1.

Research Question 2: Does one-year virtual professional development (VPD) intervention scales up degree of treatment teachers' usage of QS strategy? Scatter plot in Figure 11 shows the trend that VPD intervention can positively predict teachers' strength of using QS strategy.

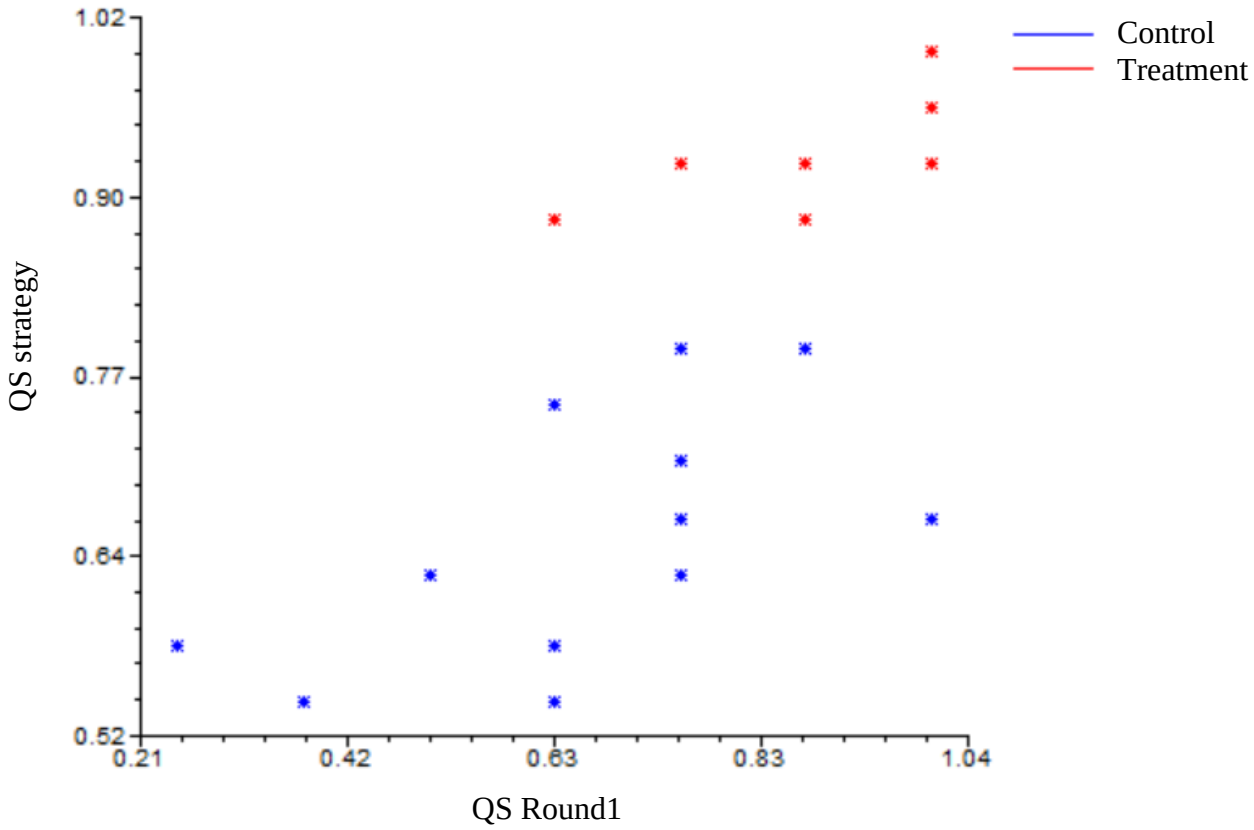

Figure 11. Effects of VPD intervention on teachers' levels of using QS strategy.

Level-1 Model: $QS_{ij} = \beta_{0j} + \beta_{1j}*(QSRound1_{ij}) + r_{ij}$

Where *i* indexes teacher and *j* indexes school condition (Treatment or Control). Outcome measurement is a teacher's three rounds average QS strategy degree, predicted by his first round QS strategy degree. The mean QS strategy degree of the *j*th school adjusted for QS-Round 1 is $\beta_{0j.}$ The effect of Round 1 QS level on three rounds average QS level under *j*th school is β_{1j}. *rij* is the level-1 residual variance that remains unexplained after accounting for the covariates.

Level-2 Model: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(CONDITION_j) + u_{0j}$

$\beta_{1j} = \gamma_{10}$

The adjusted mean under a school is further predicted by the school treatment condition.

Mixed Model: $QS_{ij} = \gamma_{00} + \gamma_{01}*CONDITION_j + \gamma_{10}*QS1_{ij} + u_{0j} + r_{ij}$

Results in Table 6 showed a positive significant main effects of school's VPD treatment condition on teachers' QS teaching strategy level (p<.001). On average, the percentage of QS application degree under VPD condition was significantly higher than teachers without VPD treatment. Controlling effects of initial time round QS strategy level, teachers apply 22% degree QS strategy in treatment classes higher than teachers in control classes during the first-grade school year (p<.001). The effect size of VPD is 87% of a standard deviation with a 95% confidence interval of [.284, .308] on QS strategy. The evidence shows the strength of applying QS strategy is strongly associated with VPD intervention.

The model graph equation is shown in Figure 12. It displays the regression-adjusted group means for the QS coding score by VPD intervention. There is a significant positive impact of conducting VPD intervention on QS level.

Table 6

Parameter Estimates of Model 2

Fixed effects	Coefficient	Standard error	t-ratio	*df*
Intercept (γ00)	0.49**	0.048	10.20	23
QS-Round1 (γ10)	0.25**	0.069	3.63	24
School Condition (γ01)	0.22**	0.029	7.65	23
Random effects	Standard Deviation	Variance	*d.f.*	χ2
σ_u^2 （teacher level）	0.02	0.00057	23	0.257
σ_e^2 （Residual）	0.05	0.00252		

*p < .05. **p < .001

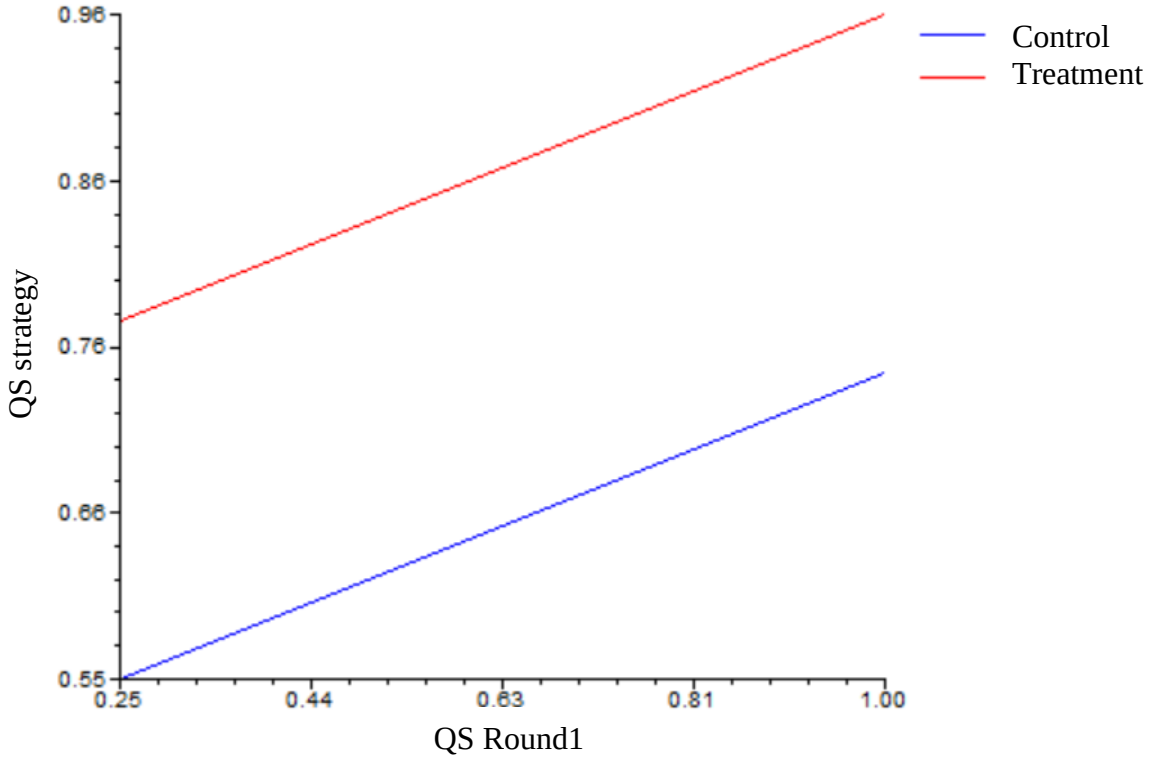

Figure 12. The model graph equation of model 2.

The two HLM models linked VPD, instructional scaffolding and students' academic oral English achievement and solved two research question. First, QS strategy creatively combined both leveled question and student involvement. It is helpful for students to receive comprehensible oral English input; it also provides opportunities for ELs' verbal interaction by practicing the contextualized language, meanwhile encourages students' participation into activities in the classroom and offering their opportunities for active involvement. Second, VPD is a significant factor to enhance teachers' QS strategy applying degree, it coaches teachers'

knowledge and skills and guides teachers to engage students in academic oral English proficiency. In summary the VPD intervention ensured treatment teachers in this study are well-trained and achieve the higher-level standard of scaffolding QS strategy, and the more frequent QS strategy applied among EL students, the better EL students perform on academic oral English proficiency.

Discussion

The U.S. schools are a conglomerate of students with the multi-cultural background, and a large amount of EL students underperformed their native peers in a long term (Buttery & Anderson, 1999; Hodge, Lieberman, & Murata, 2017). Hence, teachers should be acquainted with EL students' characteristics and tailor the personalized teaching program for them (Irby et al., 2008; Lara et al., 2009). Professional development (PD) has been widely adopted to improve teachers' teaching quality as well as students' learning achievement (Markussen-Brown, Juhl, Piasta, Bleses, Højen, & Justice, 2017; Thadani, Roth, Garnier, Seyarto, Thompson, & Froidevaux, 2017).

Previous systematic review studies have proved that leveled question scaffolding can promote students communicate more effectively with content-based vocabulary, English grammar and sentence structure so as to reach native-like oral language level (Geertsen, 2003; Limbach & Waugh, 2010; Todd & Shinzato, 1999). These achievements are also the advanced ELPS requirements for K-12 EL students' speaking ability by TEA. EL students' involvement activities such as pair-sharing are beneficial for them to oral communicate with other minority or majority students, also builds their confidence and better social development (Ogbu & Matute-Bianchi, 1986; Roslan, Rosli, Ariffin, & Esa, 2017). As Cummings (1991) advocated students

working together to develop critical thinking skills. Students can speak loudly their inner voices when sharing thoughts and eavesdropping others' dialects. During their discussion, teachers can intervene or evaluate their answers if needed. Therefore, the finding that QS strategy can be applied to improve EL students' oral language proficiency because it is meaningful to create a joyful environment that facilitates interaction between EL students and teachers.

Very limited studies ever connect PD with instructional scaffolding as well as students' achievement. Only Babinski et al. (2017) conducts a random control trail study among elementary school EL students and observed teachers' high-impact instructional strategies after PD intervention, they found implementation of teachers' strategies are closely related to students' literacy skills. But researchers only defined two types of instructional strategies as constrained skill and unconstrained skill, without stating clear differences the instructional strategies were. Their PD are traditional methods such as workshop and in-school coaching, not instantly and flexibly based on internet. Another breakthrough of the empirical research was proving that initial level of oral English-language proficiency in early grades is not a determinant of ELs subsequent oral English language acquisition, appropriate oral language teaching scaffolding has been found to support ELs' leveled critical thinking by accelerating verbal proficiency and the data results of an RCT project were analyzed to proof the theoretical results, the empirical study contributes to the sparse literature based on evidence-based practices for related topic.

In summary, the findings of this study are significant to support administers, teachers to improve ELs' academic skills at school and fill the gap that linking VPD, with teaching strategies and students' language achievement. Current study makes contribution towards a) the positive significant effects of VPD on EL teachers' QS strategy practice and b) the positive

significant effects of QS strategy on EL students' academic oral language development. Reference the findings of my previous systematic review which revealed instructional scaffolding is still waiting for further development, my empirical study in this chapter fill the gap that lacking empirical study to explain successful instructional scaffolding theoretically and statistically. In this RCT study, treatment teachers practice QS strategy more frequently after VPD training and QS strategy works effectively then further affects EL students' oral language proficiency. Therefore, the scientific quantitative study present QS strategy is a successful instructional scaffolding and conducive to first-grade students' oral language achievement.

Limitation

There are several limitations in this study. First, the outcome measure only included oral proficiency, which builds a foundation for literacy, which in turn, is complex and involves the orchestration of many different domains or abilities, such as phonological, reading comprehension, syntax, writing, or grammar (Barr et al., 2012; Jimerson & Kaufman, 2003, Shanahan & Beck, 2006). Secondly, the WMLS-R PV test is an assessment used to test if students can connect subjects they see with their English names, but it cannot reflect students' English oral proficiency comprehensively, students' intonation, syntax, or grammar abilities needs the further test. Besides, the sample in this study was Hispanic-English language learners'. Future studies that involve ELs with a native language other than Spanish are much needed to get a more comprehensive understanding of how to best promote ELs from the multilingual cultural background. Finally, QS is the only strategy included in this research, more scaffolding methods such visual scaffolding, academic language scaffolding also deserve to be analyzed.

Conclusion

At lower-grade level in elementary schools, oral language development is the primary focus for educating EL students, along with age-appropriate literacy skills (Marietta & Brookover, 2011), while a lot of EL students with limited English proficiency has not accepted personalized teaching strategy and sufficient lass involvement (Kim, 2010), to solve the current issue, my study retrieved data from the English Language and Literacy Acquisition-Validation project (ELLA-V; Lara-Alecio et al., 2012), which is a randomized control trial (RCT) working on Kindergarten to Grade 3 EL students across urban, suburban, small town, and rural Texas school sites. Instructional scaffolding was proved to be closely connected to students' cognitive academic performance (Tong, Lara-Alecio, Irby, Mathes, & Kwok, 2008). QS strategy takes learners' cognitive stages into consideration and develops their cognition during ZPD field, then providing instructional scaffolding related to verbal and aural skills for cultivating English language learners' higher critical thinking (Lara-Alecio, Tong, Irby, & Mathes, 2009). This empirical study testified QS strategy can function effectively as an ESL teaching strategy to improve students' CALP language proficiency. Results show that treatment teachers received high-quality virtual professional development (VPD) and apply QS strategy into intervention instruction. VPD is a creative, flexible, internet-based training method. To convert or coding bilingual teachers' class performance, this study introduced a scientific way to measure their pedagogical skills by TOR (Teacher Observation Record) based on Four-Dimensional Transitional Bilingual Pedagogical Theoretical model (Lara-Alecio & Parker, 1994; Bruce, Lara-Alecio, Parker, Hasbrouck, Weaver, & Irby, 1997). The instrument Teacher Observation Record (TOR) coded teachers' class instruction accurately for evaluating teachers' class behavior scientifically.

The results of this study suggested that treatment teachers practice QS strategy more frequently and the VPD training is constructive to improve teachers' ability to apply QS strategy. In conclusion, this study contributes to the perspective that PD is a positive predictor towards teachers' teaching skills, and EL students' academic oral English proficiency will clearly benefit from such instructional scaffolding designed based on their characteristics. Future study would concentrate on the possibility of QS strategy adapting EFL teaching context or whether the QS strategies effects different ELs' language domains including writing, reading or syntax, vocabulary, grammar by various types of assessments.

CHAPTER IV

ADAPTING LEVELED QUESTION SCAFFOLDING IN SUPPORTING STUDENTS' COGNITIVE ACADEMIC ORAL ENGLISH DEVELOPMENT IN EFL COUNTRIES: A PRACTICE GUIDE

Overview

With the economic globalization, English has become the most commonly used language in the world. Millions of learners in English as foreign language countries are studying English as a required course at school or practicing English as a communication tool for careers need. Equivalent to Els in ESL countries who lack L2 exposure, EFL learners are facing challenges in improving oral English fluent because of lacking language environment, interpersonal oral interaction or self-confidence. In this study, I introduce the leveled questions scaffolding teaching strategy, an empirically based teaching strategy, and argue that this strategy can enhance English learners' oral communicative competence if effectively applied into teaching practice in EFL countries. Finally, I call for the conversion of traditional teacher-centered stereoscopic class to student-involved language teaching.

Introduction

According to Teachers of English to Speakers of Other Languages (TESOL) association, there are more than 1.5 billion EFL learners across the world, in which Southeast Asian EFL learners accounted for more than 600 million, and this number keeps on growing (Matsuda, 2017; McKay, 2018; Weir & O'Sullivan, 2017). English language teaching is also highly valued within EFL countries' educational system. Take China as an example, courses (such as mass

media, international trade, technology) offered in higher education have been converted from Chinese medium instruction (CMI) to English medium instruction (EMI) (Tong & Tang, 2017). In taught in primary, junior and senior high schools, English language has been added into national curriculum as compulsory course with a history of forty years since 1978, after the reform and opening policy (Hu, 2005; Li, 2010). In Korea and Japan, English as a required class begins at elementary school and oral English skill is especially emphasized (Butler, 2004; Ghorbani, 2009). In Iran, English is the dominant foreign language that students must study from junior high school to college; it has also been regarded as a social language for higher education requirement, better job opportunities or international travelling (Akbari, 2015). In all Swedish secondary schools, students are required to be tested in English every year (Olsson, 2018).

Despite continuous reforms with curriculum revolution or new policy made to promote EFL students' English proficiency, their English communicative capacity is still not satisfied towards adapting in current society (Chen & Goh, 2011). Especially in oral language production, which is the biggest challenge among four language domains because EFL students are studying English in non-English speaking environment (Zhao et al., 2017). Behroozi and Amoozegar's (2014) research showed that Iranian students who have learnt English for more than 7 years were not able not speak English fluently with correct grammatical sentence structure. Exley (2005, p11) conducted a qualitative study by interviewing five Australian teachers, who described Indonesian students' English performance as "passive, shy and quiet".

The reasons for students' underperformance in oral English include: First, in some EFL countries such as China, students are facing cognitive, linguistic, affective obstacles because they are motivated by school administration exam, job demand or personal entertainment, while not communicate English spontaneously as daily language (Li, 2010). Second, in some EFL

countries such as Iran, students have limited access to foreign internet, English reading materials or teachers and therefore have few chances to practice target language (Akbari, 2015). In the aspect of teaching issues, in EFL countries such as China, Iran, and Japan, the major purpose of school teachers is to help students gain better grades rather than to improve students' English performance in effective communication (Ghorbani, 2009). In addition, the majority of English teachers in EFL countries also speak English as a foreign language, who may not have sufficient native English proficiency or even enough self-confidence to teach English effectively (Butler, 2004; Kim, 2009). What's more, when students enter higher grade level, they do not receive critical cognitive training accordingly. Wen-Cheng, Chien-Hung, & Chung-Chieh, (2011) report revealed that college students complained that their English textbooks only emphasize on simple linguistic content. These research findings imply that external environment (such as schools) that EFL learners experience can function in cultivating students cognitive thinking skills in English, and school teaching can directly impact individual students' learning habit, attitude and achievement.

In this paper I attempt to provide a solution at teacher level. Effective teaching strategy is critical in teaching EFLs to reach higher level critical cognitive skills and to facilitate a transition from teacher-centered language teaching approach to student-engaged language teaching approach (Borich & Stollenwerk, 1988; Nussbaum & Novick, 1982; Richards & Rodgers, 2014; Whittington, 2003). More specifically, I introduce Leveled question scaffolding (QS) as an important teaching strategy that should be extensively used by EFL teachers to improve students' oral cognitive English learning. It was derived from the fundamentals of Piaget's (1961) genetic epistemological cognitive development theory, Vygotsky's (1964) sociocultural zone of proximal development (ZPD) theory and Bruner's (1978) instructional scaffolding theory, Lara-

Alecio & Parker's (1994) Four-Dimensional transitional bilingual pedagogical theory and has been testified in a large-scale random control trail (RCT) study that was presented in Chapter III.

Purpose

This study aims to discuss the significance and specific implementation of leveled question scaffolding teaching strategy, explain "what" "why" and "how" the theoretical and empirical evidence-based QS strategy should be adopted in EFL countries to promote EFL students' oral English and critical thinking skills. There are two research questions:

1. What are the interpretation and recommended techniques of QS strategy?
2. Why disseminating QS among EFL students is imperative?
3. How to disseminate QS among EFL students to improve their cognitive academic oral English proficiency?

Traditional School English Medium Instructions in EFL Countries

Course Content Design

The prevalent principles of English instructional norm in EFL countries concentrates on supporting students to master grammatical structures and correct sentence structures throughout elementary, secondary or college grade (Johansson, 2017; Natl, 2011). Student grammatical rules are improved without correct and conscious pronunciation and coherent oral expression. Besides, the task-based course is driven by national English assessment. Most important English national test such as Education First English Proficiency Index in Sweden, College Entrance Examination in China only test students' listening, writing and reading (Olsson, 2018).

Teaching Method and Students' Involvement in Oral English Interaction

Traditional EFL teaching remains in teacher-centered leading, such as narrative lecture, repetition, and follow-up questions. Seldom are students provided opportunities to solve problems by themselves (Olsson, 2018). Because of foreign language anxiety (Horwitz, Horwitz, & Cope, 1986), students are unwilling to discuss with their peers and are not used to talking in English with classmates after class. When the English class is led by teacher at majority of time, students feel uncomfortable to ask or answer questions spontaneously, so they even have less chance to speak in English. Additionally, most English teachers in EFL countries are EFL speakers themselves and may not have overseas experiences in English countries. Their insufficient pedagogical knowledge may affect students' oral production (Chen & Goh, 2011).

Implementation of Innovative Course Design in EFL Countries

Because of traditional English course mode and reformed teaching method, EFL students' communicative involvement are neglected and their oral English is far left behind compared to their reading or writing ability. To help more EFL students improve academic English oral language, their English medium course can be designed as following four steps.

Step I-Implementation of STELLA Instruction in EFL Class

Story Retelling and Higher Order Thinking for English Language and Literacy Acquisition (STELLA) instruction is "comprised of scripted lessons with controlled higher order thinking questions" (Irby et al., 2008). Teachers can help EL students' master basic linguistic patterns and interpersonal communicative skills based on students' oral retelling feedback performance elements for further evaluation or analysis. It is a synthetic instructional tool designed based on Hansen (1978), Slavin & Madden's (1999) story retell theory, which

combined structured story-reading component with interactive read-aloud strategies for teaching ELL students. STELLA integrated ESL instruction with asking higher order leveled questions to develop students' academic knowledge, explicitly teaching vocabulary in the content area of science as well as providing opportunities for students to practice language through retelling and includes EL teachers' training. It has been applied and validated as intervention instruction during the ongoing ELLA-V project.

Step II-Implementation of QS Strategy in EFL Class

Leveled question strategy (QS) means incorporating the leveled question teaching strategy in teaching English learners (ELs) to reach higher level oral cognitive skills. It has been validated by federal funded randomized controlled trial (RCT) project English Language and Literacy Acquisition-Validation (ELLA-V; Lara-Alecio et al., 2012) that can improve EL students' English reading level and oral English proficiency skills significantly.

Leveled questions require questions associated with level 2-5 of Bloom's taxonomy framework. The newest version of the Bloom's Taxonomy has been published by Anderson and Krathwohl in 2001. In the revised Taxonomy, Knowledge category was named Remember, the Comprehension category was named Understand; Application, Analysis, and Evaluation were retained, Synthesis exchanged places with Evaluation and was renamed as Create and categorized at the top level representing highest-order thinking process (Anderson & Krathwohl, 2001). Six categories could overlap, mastering the lowest level of the hierarchy was not a requirement for moving to the next higher level (Anderson & Krathwohl, 2001):

- Remember-students recognize or recall knowledge from long-term memory;
- Understand-students understand and construct meaning from oral, written or visible graphic messages;

- Apply-students use information in new method;
- Analyze-students distinguish relationship between different parts;
- Evaluate-students make judgement or justify decision;
- Creating-Students put elements together to form a new product or point of view.

For example, when reading a storybook to Grade 1 students, the teacher points to a cat in the picture and say, "what is it?". Although it is a low-level question or level 1 question at "Remember" level, which only let students recall what they already knew in memory, it is effective for children at younger than age 7 who can only think about a word or an object symbolically. Then it's necessary to encourage students thinking in higher cognitive level, such as reflecting about two objects at one time, then the teacher can ask them "What's the difference between a cat and a dog", which is a level 4 question at "Analyze" level because it lets students compare different animals through answering open-ended question. If the student answer correctly, the teacher will just give positive praise such as "Good job". When the student cannot answer the question by himself or herself, which means he or she needs support at the zone of proximal development (ZPD). The teacher should provide support like asking him or her "Do you need a hint?" "Do you want to discuss with your friend" "Do you need more time to think?" to help students speak out critical thinking answers by themselves or by peers' support. The whole teacher and students' activities can be translated into reliably observable or codable.

If students cannot answer the question correctly, teachers should provide them support they need to achieve higher thinking skills. The scaffolding method of QS strategy consists of random selection, leveled question, peer-assistant, visual cue, choral response, write/illustrate using white boards, cognitive feedback, etc. For example, when an unfamiliar word was introduced to students, a well-trained elementary school EL teacher will present with a picture

card or picture in the storybook and ask students related questions like "Have you ever seen a bird?" "How does it fly? Show me with your arms". Then ask students by random selection to make new sentences with this new word. To encourage all students to participate in the class activity, the teacher should ask students randomly by drawing a name from popsicle sticks. Students are also encouraged to answer spontaneously or provided chanced to discuss with partners. To inspire students' higher order thinking, the teacher should ask leveled questions at evaluation or synthesis level according to Bloom's Taxonomy such as "What impressed you the most about the story?" Besides, cooperative learning is suggested before students provide answers, it is considered as the most efficient way for low-achieving students accepting help from their peers during shared learning, and teachers will involve all students into class activities when they converse in pairs. The functional application of cooperative learning has been advocated based on personal experience (Holt, 1992), systematic review (Whitsett & Hubbard, 2009) and survey (Eslami & Fatahi, 2008) in the U.S. Besides, teachers are also motivated to monitor students' comprehension meanwhile checking students' comprehension by asking the scripted leveled question, students are also encouraged to discuss the question with partners, by choral response or writing illustration (Tong et al., 2017). These researches were conducted in English-speaking setting, and I believe they can also be adopted and applied in EFL context.

Step III- Implementation of Virtual Professional Development in EFL Class

Virtual professional development (VPD) is an intervention at teachers' level during their practice of unfamiliar newly developed teaching method, materials, and textbooks. It provides teachers specific techniques and coaching online to know how to adopt proper teaching strategies to achieve efficient teaching results. Reference to the VPD designed during ELLA-V project,

researchers shall provide VPD biweekly through online software such as Citrix GotoMeeting and observe teachers' instant performance in class (Corcoran et al., 2014).

Step IV- Implementation of WMLS-R in EFL Test

Woodcock-Muñoz Language Survey-Revised (WMLS-R) was an oral and reading English language measurements designed for EL students (Woodcock et al., 2005). This is an individually administrated test with seven independent subtests encompassed of oral language, language comprehension, reading, and writing assessment (Sandilos et al., 2015). Each subtest was constructed to measure cognitive-academic language proficiency (CALP). Testing content has increasing difficulty which is easier at beginning items and more complex gradually.

Discussion and Conclusion

Teachers' question was defined as teachers use question prompts in scaffolding knowledge to students (Xun & Land, 2004). According to Kim (2010), EL students who were exposed to teachers' questions showed improved oral English proficiency after one semester. Teachers' scaffolding questions can be used to elicit students' explanations and contribute self-reflection ability. Leveled question in this study is more helpful to assist students' higher level critical thinking skills.

Previous studies related to English language pedagogy in the EFL countries focused on government made policies (e.g., Su, 2006), problems in English teaching and learning (e.g., Hu, 2005), or on the case study of teachers' instructional practice (e.g., Nabei & Swain, 2002). However, effective teaching strategies, especially in the domain of spoken English have been less studied.

In this paper, I state the significance of QS strategies for teaching EFLs and explained specific implemental procedures. This article introduced how to implement QS strategy in EFL countries. When scaffolding new English content, a well-trained EL teacher should randomly select one student and asks him a question in English (L2) by scaffolding a leveled question (level 2-6 cognitive levels' content based on Bloom's Taxonomy) strategy. As response, students are required to first listen aurally, then answer verbally in English (L2) related to dense content (CALP). Teaching and learning activities can then be translated into codable elements to monitor if teacher applied leveled question to improve students' leveled thinking skills in the oral communication mode.

Among various approaches to facilitate the learning of higher leveled thinking skills and oral language, leveled question scaffolding is a unique method combining both students' participation and teachers' guidance; it can assist ELs with activities such as students answering and asking questions aurally, verbally and simultaneously or peer-tutoring. The question can be a lower level cognitive pattern, allowing students to recall information in memory; or a higher level cognitive pattern, encouraging students to make rational decisions based on analysis, evaluative or critical thinking and probe alternatives as described by Bloom's taxonomy (Bissell & Lemons, 2006; Miri, David, & Uri, 2007).

In summary, this study provides new directions of EFL education as a guidance to teachers who desire to enhance the quality of academic oral English teaching and learning in their classrooms. The next step is to conduct empirical research using QS to examine the impact of such instructional scaffolding on EFL learners’ academic oral language development.

CHAPTER V

CONCLUSIONS

My dissertation aims to investigate the use of leveled question as instructional scaffolding on English learners' academic oral English proficiency. Leveled question scaffolding (QS) strategy was derived from the fundamentals of Piaget's (1961) genetic epistemological cognitive development theory, Vygotsky's (1964) sociocultural zone of proximal development (ZPD) theory and Bruner's (1978) instructional scaffolding theory, Lara-Alecio & Parker's (1994) Four-Dimensional transitional bilingual pedagogical theory and has been testified in a large-scale random control trail (RCT) study. The dissertation consists of three journal-formatted articles.

In the first article, a systematic review was conducted to extract current literature reports of effective teaching strategies. 467 articles were included as potential database concerning "EL", "Oral English proficiency", "instructional scaffolding". 11 empirical studies were remained as included database and 7 effective teaching strategies, which can help improve K-12 EL students' oral English proficiency were extracted. The systematic review revealed that there is insufficient study purposed to improve EL students' oral English ability through effective instructional scaffolding within scientific research procedures.

In the second article, based on revealed issue of previous systematic review, I conduct a quantitative analysis with data derived from a randomized control trail (RCT), i.e., Project ELLA-V. 12 treatment teachers and 13 control teachers, 218 treatment students and 246 control students were chosen as research participants. A hierarchical model was built to investigate whether teachers' intensity of QS usage predict first grade ELs' oral performance controlling for students' initial oral proficiency and whether one-year virtual professional development (VPD)

intervention scales up degree of treatment teachers' usage of QS strategy. The results of this study provided evidence of compelling and positive effects of QS strategy and VPD intervention on elementary school EL students' oral English development.

In the third article, a practice guide was proposed regarding the practicability and need to adopt QS scaffolding as a teaching strategy for EFL students. I describe the steps of integrating QS strategy, STELLA instruction and VPD intervention in EFL countries and illustrate that although implemented among ELs in an English-speaking country, these steps can also be adopted to be practiced in EFL settings.

In conclusion, leveled question scaffolding (QS) strategy was designed combining both teachers' questions and students' involvement to accelerating students' cognitive content understanding level according to the four-dimensional transitional bilingual pedagogical theory. Based on the research results from theoretical and evidence, the effective teaching strategy leveled question scaffolding combining VPD intervention can be applied to promote EL teacher school teaching and EL student's English oral proficiency.

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APPENDIX A

Checklist of 27 Items to Include When Reporting a Systematic Review

Items		My Study
Title	1. Was the study a systematic review or Meta-analysis	Y
Abstract	2. Did the study provide structured Summary	Y
Introduction	3. Did the study provide rationale of review?	Y
	4. Did the study state participants, interventions, comparisons, outcomes, and study design?	Y
Methods	5. Did the study indicate review protocols?	Y
	6. Did the study report characteristics of criterions?	Y
	7. Did the study describe all information sources?	Y
	8. Did the study present full electronic strategy?	Y
	9. Did the study state process of selecting study?	Y
	10. Did the study describe method of data extraction?	Y
	11. Did the study define variables of data?	Y
	12. Did the study assess risk of bias in individual article?	Y
	13. Did the study describe principle summary measures?	Y
Process	14. Did the study describe method of additional analyses?	Y
	15. Did the study assess risk of bias from accumulated evidence?	Y
Results	16. Did the study describe data of additional analyses?	Y
	17. Did the study give numbers of reviewed articles?	Y
	18. Did the study present characteristics from data extraction?	Y
	19. Did the study present data on risks of bias?	Y
	20. Did the study present outcomes of reviewed articles?	Y
	21. Did the study present all results of each meta-analysis?	Y
	22. Did the study present results of risk assessment?	Y
	23. Dis the study give results of additional analyses?	Y
Discussion	24.Did the study consider outcomes to specific group?	Y
	25. Did the study discuss the limitation?	Y
	26. Did the study provide implications for future study?	Y
Funding	27.Did the study describe the funding for the systematic review?	N

APPENDIX B

SICEP Coding Record of 11 Empirical Studies

Klingner & Vaughn, 2000	Carrier, 2003	Cuestas, 2006	Kennedy, 2008	Kim, 2010	Lara et al., 2012	Jiang et al., 2014	Mostafavi & Vahdany, 2016
Peer-reviewed Journal	Peer-reviewed Journal	Peer-reviewed Journal	Peer-reviewed Journal	Peer-reviewed Journal	Peer-reviewed Journal	Peer-reviewed Journal	Peer-reviewed Journal
Peer interaction theory (Cazden, 1988; Garcia, 1994)	Cognitive theory (Anderson, 1983, 1985; Bruner, 1990)	Music and rhythem application in language learning (Phillips, 2003)	ESL instruction tool of Music (Schunk, 1999)	Scaffolding concept in language learning (August & Hakuta, 1997)	Bruner's (1978) instructional scaffolding theory and Lara-Alecio and Parker's (1994) bilingual pedagogical theoretical model	Cross-linguistic transfer theory (Cummins, 1991, 2005, 2007)	Taxonomy of affective strategies (Oxford's,1990)
U.S.	U.S.	Colombia	U.S.	Australia	U.S.	China	Iran
Public school	Public school	Public school	Public school	Public school	Public school	Public school	Public school
Grade 5	Secondary Grade	Grade 10	Grade K	Grades 4–6	Elementary Grade	Grade 4-5	Grade 12
Science	Science	English Language	English Language	English Language	Science & Reading	Chinese Language Arts	English Language
ESL	ESL	ESL	ESL	ESL	ESL	EFL	EFL
37/2/1	7/1/1	N/A	9/1/1	9/1/1	246/12/4	10/2/1	60/1/1
4 weeks	15 classes; 6 weeks	N/A	30mins/week; 10 weeks	1 year	2 year	7 Months	6 weeks
Workshop	N/A	N/A	N/A	Monthly research conversation	Professional Development	N/A	N/A
Discuss and assist peers to learn new words, and content in reading materials.	Listening instruction by video materials	Learn new words, rhythem from songs' lyrics	Chanting, rhythm, singing, movement to music, lyric analysis	Teachers' question scaffolding (coaching, facilitating, and collaborating)	Cognitive questions, and scaffodling such as pairshare, choral response	L1-L2 code switching	Affective training (visualization, humor, positive talk)
Video Tapes	N/A	Observation Notes	N/A	N/A	Teacher Observation Record	Observation Notes	N/A
25-word, self-reported vocabulary test	2-minute video segment test	Observation Notes	Self-reported English speaking checklist	Observation Notes, video recording, audio recording	District Benchmark Science & Reading Tests	Observation Notes	Oral Communication Assessment Scale
Descriptive statistics	Descriptive statistics	N/A	Descriptive statistics	N/A	ANCOVA/HLM	N/A	T-test
Improve orality and literacy	Improve orality	Improve orality and literacy	Orality	Improve orality and literacy	Improve orality and literacy	Improve orality and literacy	Orality
N/A	N/A	Postive Effects	N/A	N/A	Postive Effects	N/A	Postive Effects

APPENDIX C

Real Scenario Observation for QS Application

OVERVIEW

This is a real scenario of the observation of a Grade 1 teacher teaches a story to students, the teachers asked leveled question, random select students to answer, and scaffold the question for students understand better by visual cue and pair-share:

PHASES	TEACHER GUIDE	STUDENT RESPONSE
ASKING LEVEL 2 QUESTION	Boys and girls, what is the problem of the story, I want you to think, use your head, now turn around and talk to your partner.	(talking with partners)
RANDOM SELECTION	Let me choose one student to give us an answer (Pick up one from craft sticks). Jocelyn, what is the problem of the story?	(cannot answer)
SCAFFOLDING	Repeat after me "the problem of the story".	The problem with the story
	What is the problem? (wait for a few second and turn to other students), what is the problem with the story?	A frog
	The answer is not an animal, think about what is happening in the story? Let me ask someone else (pick up another one from craft sticks). Belinda? Is the frog?	Sad

PHASES	TEACHER GUIDE	STUDENT RESPONSE
ASKING LEVEL 3 QUESTION	Yes, the problem is the frog is sad, why does it not happy? Who helped him to solve the problem? (After reading the story)	Its hat is lost, rabbit helped him
ASKING LEVEL 5 QUESTION	Have you ever actually help your friends? When and what you help them do?	Yes, I helped my friend….

Comments: The teacher did excellently and reached more than 75% of QS strategy because she asked leveled question and let students do critical thinking and scaffold knowledge for students by guiding pair-share and randomly select a student to answer.